

10th Annual

*Undergraduate Research
Conference: A Symposium of
Scholarly Works &
Creative Projects*

*Student Impact &
Innovation Showcase*

April 23rd Online
9:00 am – 4:30 pm

Register: <https://bit.ly/3vMPCzI>



METROPOLITAN
STATE UNIVERSITY™
OF DENVER

CONFERENCE AT A GLANCE

9:00 a.m. Welcome Remarks

9:30 a.m. Conference Session I

Oral session (9:30-10:30)

Poster session (9:45-10:45)

10:45 a.m. Conference Session II

Oral session (10:45-11:45)

Poster session (11:00-12:00)

11:45 a.m. Lunch Break

12:45 p.m. Keynote: Ronald Rael: Rasquachando!

1:45 p.m. Networking

2:15 p.m. Conference Session III

Poster session (2:15-3:15)

Oral session (2:30-3:30)

3:30 p.m. Conference Session IV

Poster session (3:30-4:30)

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WELCOME FROM THE DIRECTOR

This has been a year in which we have had to find our resilience, adapt to a significant disruption to our daily lives, and become innovative in the way we teach, learn, and interact. The fact that we are celebrating over 100 projects at our online conference this year, is a testament to the resilience and innovation of our Roadrunner community.



When I started at MSU Denver in July, I thought being remote would make it difficult to form connections. However, MSU Denver has cultivated a community that transcends the computer screens of remote learning. It is with that same sense of community I hope we can come together to celebrate the achievements of our students and their mentors at this year's virtual conference. This year our conference brings more of our community together by including Student Impact & Innovation Showcase and Modern Languages. I hope you will attend a webinar-style oral session, have a conversation with a poster presenter in their virtual room, stop in one of the virtual lounges for informal conversation, and don't forget to see our keynote speaker on the main stage. Oral session and mainstage recordings are available on the conference platform for 30 days after the conference.

Thank you to all the faculty and staff who mentored students in undergraduate research and creative scholarship. A special thank you to all the students who did the work and were ready to share their work on a new platform. On behalf of myself and the conference planning committee, welcome!

Kristy L. Duran, PhD
Faculty Director of Undergraduate Research
Professor of Biology
Metropolitan State University of Denver

Conference Planning Committee:

Kira Castle
Jill Lange

Alyssa Marks
Lori McKinney

Elizabeth Parmelee
Mandi Schaeffer Fry

WELCOME FROM THE PROVOST

This year marks the 10th anniversary of the Undergraduate Research Conference at Metropolitan State University of Denver. In my estimation, there is something truly exciting about making tangible scholarly contributions invoked by a desire to answer questions stimulated by your experiences or the experiences of others. These questions often sit at the intersection of multiple disciplines that afford you the opportunity to develop academically and professionally as you create and discover knowledge. I encourage this year's participants to embrace the research arena with boldness, care, and humility. And, never underestimate your potential to contribute to the world's social and scientific consciousness.



You will find that knowledge is never settled and there is a need to continuously interrogate and sometimes trouble existing intellectual waters to advance our common humanity that is continually evolving. This is the bedrock for research. For some, your participation in this conference will shape your scholarly identity for years to come. I encourage you to be altruistic with your findings and publish it for the world to see. As I think about today's undergraduate research conference, I am reminded of the words of two indigenous intellectuals, Gabriela Ramos and Yanna Yannakakis, who offered that writing provides the most accessible evidence of intellectual work. I must warn you, however, that research and writing can become addictive, an addition that helps us understand the past and present while lighting the way to the future. Continue to embrace your passion for ideas and the passion to know.

I look forward to joining you and becoming smarter from your research.

I want to thank faculty and staff who continue to nurture undergraduate research at MSU Denver and for allowing us to carve out a significant imprint of being Roadrunner 'Researchers On the Move'.

To this end, I say welcome to all.

Alfred Tatum, PhD
Provost and Executive Vice President for Academic Affairs
Metropolitan State University of Denver

WELCOME FROM THE PRESIDENT

Each spring at Metropolitan State University of Denver we have the opportunity to showcase the remarkable academic and creative achievements of our Roadrunner students through two events, the Undergraduate Research Conference: A Symposium of Scholarly Works & Creative Project and the Student Impact & Innovation Showcase. These events never cease to amaze me and serves as a great reminder of the brilliance and value our students bring to MSU Denver, their families, and their communities.



Throughout your time at MSU Denver you have continued to embody the Roadrunner spirit through your academic talent, personal resilience, and professional ability, accomplishments that have been further accentuated by your ongoing commitment to your scholarship amidst the COVID-19 pandemic. You have faced immense personal, academic, and professional challenges over the last year, and your participation in today's conference reaffirms not only your excellence, but your perseverance as well.

The diversity of projects being presented is a testament to the talents and abilities of our students and their faculty mentors in addition to the human capacity to explore new ideas, invent new ways of doing things, challenge assumptions, and create new narratives. In the face of this pandemic, every one of you, your faculty, and your friends and families, has a role to play in reimagining what the world can look like in the future and we are proud that you will carry with you the values of community, diversity, excellence, and respect as you continue to challenge yourself with research projects and creative endeavors that will help us address, as a society, the complex problems and issues that confront us.

We are honored to be part of your path and to have you share with us the discoveries of your research and the insights of your creative endeavors! Thank you for the time and energy you have dedicated to these projects, for adapting to a changing world, and for providing me the privilege of being a small part of this day. By participating in the Undergraduate Research Conference: A Symposium of Scholarly Works & Creative Project and the Student Impact & Innovation Showcase despite this year's challenges, you are proving the theory that Roadrunners are always seeking to reimagine what is possible!

Janine A. Davidson, PhD
President
Metropolitan State University of Denver

KEYNOTE

Ronald Rael

Ronald Rael is an applied architectural researcher, author, design entrepreneur, and thought leader in the fields of additive manufacturing, borderwall studies, and earthen architecture. His research interests connect indigenous and traditional material practices to contemporary technologies and issues. He often teaches graduate design thesis and undergraduate courses on Design & Activism.



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As a professor of architecture at the University of California, Berkeley, he is the Eva Li Memorial Chair in Architecture, Director of the Masters of Architecture program, and Director of the printFARM Laboratory (print Facility for Architecture, Research and Materials). He holds a joint appointment in the Department of Architecture, in the College of Environmental Design, and the Department of Art Practice and is both a Bakar and Hellman Fellow.

The London Design Museum awarded his creative practice, Rael San Fratello, (with architect Virginia San Fratello), the Beazley Award in 2021 for the design of the year, one of the most prestigious awards in design internationally. In 2014 his practice was named an Emerging Voice by The Architectural League of New York—one of the most coveted awards in North American architecture. In 2016 Rael San Fratello was also awarded the Digital Practice Award of Excellence by the The Association for Computer Aided Design in Architecture (ACADIA).

Rael is the author of *Borderwall as Architecture: A Manifesto for the U.S.-Mexico Boundary* (University of California Press 2017), an illustrated biography and protest of the wall dividing the U.S. from Mexico featured in a recent TED talk by Rael, and *Earth Architecture* (Princeton Architectural Press, 2008), a history of building with earth in the modern era to exemplify new, creative uses of the oldest building material on the planet. His work can be seen in several documentary films produced by The Museum of Modern Art for his work on the U.S.-Mexico border and for additive manufacturing, by KQED in an emmy winning documentary film about the work of his creative practice, by The New Yorker, and for his humanitarian initiatives with the international aid organization Alight (formerly the American Refugee Committee).

ABOUT OUR PROGRAMS

UNDERGRADUATE RESEARCH & CREATIVE SCHOLARSHIP PROGRAM

The Undergraduate Research & Creative Scholarship Program promotes, supports, and celebrates MSU Denver faculty and student engagement in undergraduate research activities. These undergraduate research experiences enhance students' preparedness and competitiveness for future employment and the pursuit of advanced degrees.



Kristy L Duran, PhD
Faculty Director of Undergraduate Research



Mandi Schaeffer Fry, PhD
Faculty Associate of Undergraduate Research

SERVICE LEARNING & COMMUNITY-BASED RESEARCH

Service learning students participate in regularly scheduled academic classes that have a community experience component. Community experiences can vary quite widely depending on the topic of the course, the level of training students have attained, and the requests of the community organizations or clients. Students may interact with populations like those with whom their profession interacts or they might work on applied projects, such as marketing or public relations proposals, for specific clients. Community-based research students conduct research with their faculty mentors in diverse community settings, from taking water samples in Bear Creek to surveying clients at a local food resource agency. Students have the opportunity to present their work not only to their community partners, but also to the university community via the Student Impact and Innovation Showcase and the Undergraduate Research Conference.

PUKSTA SCHOLARS

The Puksta Foundation provides funding, mentorship, and experiential community engagement for students at five universities in Colorado, including MSU Denver. Each year, a new cohort of scholars who exhibit a strong commitment to service and civic responsibility are selected to join the Puksta Scholar Program. Scholars participate in a rigorous and rewarding multi-year program designed to equip students with the knowledge, skills, and experiences necessary to become catalysts for lasting positive change in the community.

EARN AND LEARN

Internships are an imperative part of our students' experience; but not all internships are paid. Many of our students work, come from lower-income backgrounds and/or are supporting families, so being able to take time off for hands-on learning is just not feasible. MSU Denver's Earn and Learn Program levels the playing field by providing a modest stipend to students who take unpaid internships.

THE ROWDY SCHOLAR: A JOURNAL OF UNDERGRADUATE RESEARCH & CREATIVE WORKS

The Rowdy Scholar: A Journal of Undergraduate Research & Creative Works is an online, open-access multi-disciplinary scholarly research journal publishing original research and creative works, including but not limited to works prepared for classes, honors theses, or independent studies by undergraduate students at MSU Denver.

In Fall 2020, we published the second edition of *The Rowdy Scholar*, and articles are currently being finalized for the third edition! The second edition published five papers, encompassing work from eight MSU Denver undergraduate authors!

What's in a Name? Hip Hop Graffiti and Principles of Authorship

Student Authors: Melissa Camp and Mateo Candelaria

Faculty Mentor: Elizabeth Kleinfeld

The American Foreign Policy Shift During the Carter / Reagan Era

Student Author: Jose Faustino Flores

Faculty Mentors: Sheila Rucki and Elsa Dias

Preliminary Investigation into the Function of tfap2a Variants in Zebrafish

Student Authors: Thanh Bao Dan Nguyen and Jessica Patrick

Faculty Mentor: Vida Senkus Melvin

Electrochemical DNA Biosensors for Detecting Nontuberculous Mycobacteria

Student Authors: Dylan Poch and Tyler Sodja

Faculty Mentors: Andrew Bonham and Jenn Honda

Fracking on Federal Land: An Overview of the Costs and Benefits of Fracking

Student Author: Siet Wright

Faculty Mentor: Elizabeth McVicker

We'd like to thank the following faculty, who served as editorial board members for the 2nd and/or 3rd editions:

- Pamela Ansborg
- Shelby Balik (senior editor for third edition)
- Philip Bernhardt
- Erin Bissell
- Steve Geinitz
- Deborah Horan
- Christina Peters Huber
- Sara Jackson
- Kristy Lyons
- Vida Melvin
- Nhu Nguyen
- Sanaa Riaz
- John Rief
- Jason Janke
- Shinyong (Shawn) Jung
- Elizabeth Kleinfeld (senior editor for second edition)
- Kimberly Klimek
- Anahi Russo Garrido
- Rich Sandoval
- Siva Santhanam
- Mandi Schaeffer Fry (senior editor for third edition)
- Sarah Schliemann
- Erin Seedorf
- Dorothy Shapland
- Summer Trentin
- Kimberly VanHoosier-Carey
- Sheryl Zajdowicz (senior editor for second edition)



2020-2021 Undergraduate Mini-Grant Recipients

The Undergraduate Research & Creative Scholarship Program offers mini-grants of up to \$500 to support student research, scholarly works, and creative works. Congratulations to this year's awardees!

FALL 2020

- ShayLee Bunkers
- Anniston Craddock
- Cassie Gibbs
- Devyn Gussenbauer
- Zahava Heydel
- Kaily Meek
- Kayla Ritchie
- Jennifer Robertson

SPRING 2021

- Marissa Allen
- Christopher Chamblee
- Zane DeLuccie
- Rachel Nussbaum
- Dylan J Poch
- Nathaniel Roybal & Jaquelin Valenzuela
- Andrew Smith

Undergraduate Mini-Grant Reviewers

A special thank you to the following faculty and staff members who helped to review mini-grant applications this year!

- Pamela Ansborg
- Philip Bernhardt
- Erin Bissell
- Rebecca Canges
- Bill Carnes
- Megan Filbin
- Megan Hughes
- Sara Jackson
- Kim Klimek
- Jackson Lamb
- Sandra Lane
- Kristen Lyons
- Bridget Murphy-Kelsey
- Jeffrey Parker
- Emily Ragan
- Siva priya Santhanam
- Mandi Schaeffer Fry
- Nona Shipman

A special thank you to Jill Lange for coordinating the mini-grant fund allocation.



THANK YOU!

We would like to thank the following people and organizations for their contributions to the 10th Annual Undergraduate Research Conference:

- Conference program and abstract coordination: Kristy L. Duran, Mandi Schaeffer Fry, and Evan Haut
- Program scheduling: Lori McKinney, Kira Castle and Alyssa Marks
- Virtual conference session set-up: Kristy L. Duran, Lori McKinney, and Mandi Schaeffer Fry
- Sarah Harman, Petra Schumann, and Ned Hoewisch for the use CAVEA and the recording of two of our student presentations
- Video editing: John Arnold and Amanda Schwengel
- Session moderators: Pamela Ansborg, Bevon Beezle, Andrew Bonham, Kira Castle, Sonny Dhoot, Bethany Fleck Christina Foust, Mark Isenburg, Sandra Lane, Jill Lange, Alyssa Marks, Leah McFail, Lori McKinney, Siva Priya Santhanam, and Mandi Schaeffer Fry

We would also like to thank the following people for their ongoing support for the Undergraduate Research & Creative Scholarship Program:

- Elizabeth Parmelee, Provost Tatum, and President Davidson
- Undergraduate Research & Creative Scholarship Advisory Council
- Faculty mentors, who provide the opportunities for undergraduate research

*UNDERGRADUATE
RESEARCH CONFERENCE*



ABSTRACTS

Design of electrochemical biosensors for detecting P.69 pertactin associated with *B. pertussis*

Allen, Marissa – Corresponding Author

Faculty Mentor: Bonham, Andrew

Major/Research Area: Biology (BIO)/Biochemistry (BCHM)

Additional Tags: Undergraduate Research Mini-Grant Recipient

Poster Session 4 (3:30-4:30pm), Poster #3

Whooping cough caused by *Bordetella pertussis* can cause serious and prolonged health affects in people of all ages but is especially deadly in infants. Early treatment can significantly reduce the duration of illness in the patient and lead to a milder case of illness overall. Quick and accurate diagnosis is thus essential in treating the infection. Current diagnostic procedures need a relatively large patient sample and have an extended wait period for testing results. As an alternative, we are developing an aptamer-based electrochemical biosensor for the rapid detection of *B. pertussis*. To do so, our biosensor will target P.69 pertactin, a well-known adhesion factor present on the outside of *B. pertussis*. A biosensor that detects this protein can therefore be used to diagnose a *B. pertussis* infection reliably and quickly. Thus far, we have obtained purified P.69 pertactin and biotinylated the protein: incorporating a covalently attached biotin molecule through reaction with primary amino groups present on P.69 pertactin. Biotinylation results were confirmed, and biotin incorporation was measured via HABA Assay. Calculations showed that an average of 42 biotin molecules were able to bind to each P.69 pertactin protein. Currently we are continuing our development of an electrochemical biosensor through SELEX, the systematic evolution of ligands by exponential enrichment. SELEX is a process by which unique DNA sequences called aptamers are introduced to target molecules and screened for selective binding to the target, in our case P.69 pertactin. Ultimately, we plan to identify successful binding of an aptamer to P.69 pertactin, which will be characterized by next-generation sequencing. We will then utilize that sequence to construct an electrochemical, DNA aptamer-based biosensor specific to P.69 pertactin.

Visible Water Features of Pompeii

Bacca, Janaé – Corresponding Author

Faculty Mentor: Dyhr, Benjamin

Additional Mentors: Summer Trentin

Major/Research Area: Mathematics (MTH)

Oral Session 1 (9:30-10:30am), Room 2

A prominent symbol which represents social status and wealth for the people of Pompeii is the presence of a water feature in their households. We are interested in understanding the importance of not only having a water feature but having a water feature visible to the public as a means of displaying the household's wealth or social status. We hypothesize that there is a correlation between the presence of a water feature and the visibility of said water feature from the street. Using a generalized linear model, we will determine what physical attributes of individual households in Pompeii are explanatory for the variations of the presence of a visible water feature.

Predicting NCAA Men's Basketball Point Spread

Barlow, Cody – Corresponding Author

Faculty Mentor: Dyhr, Ben

Major/Research Area: Mathematics (MTH)/Statistical Science

Additional Tags: Senior Statistics Project

Oral Session 1 (9:30-10:30am), Room 2

The point spread of an NCAA basketball game is the expected point differential between Home and Away teams. In this report a model is developed to accurately predict the point spread for NCAA Men's Division I Basketball games. We use predictor variables measured from games played during the 2020-2021 season prior to 2-22-21 to predict point spreads for games played during the last two weeks of the regular season. We build a general linear regression model and the use model validation methods to test the model. We conclude by comparing our predictions to spreads advertised on popular sportsbooks.

Cultural Hybridity as Evidenced by Style: An Examination of Pre-Columbian Ceramics from West Mexico and Ecuador

Barofsky, Sydney – Corresponding Author

Faculty Mentor: Mollenhauer, Jillian

Major/Research Area: Art History, Theory and Criticism

Oral Session 2 (10:45-11:45am), Room 2

Ceramics from Pre-Columbian cultures in Ecuador and West Mexico provide visual evidence of influential connection between the two areas. Sample sets of ceramics from these regions demonstrate how this contact from travel by sea produces an impact on styles of artistic rendering. This is evidenced by characteristics of style outlined in my sample set. In addition, archaeological data supports the idea that Pre-Columbian West Mexican ceramics exhibit locally modified traits from coastal contact with Ecuadorian traders. This calls to mind theory of hybridity, where interaction with different groups of people produces a new and hybrid culture.

Keywords: localize, figurine, ceramic vessel, coastal contact, hybridity, seafaring

MSU Denver Rural Students and Food Insecurity during the COVID-19 Pandemic

Bauer, Bionca – Corresponding Author

Faculty Mentors: Emily Matuszewicz, Tai Hong Kim

Major/Research Area: Health Care Management (HCM)

Poster Session 1 (9:30-10:30am), Poster #1

Food insecurity is the lack of access to healthy and nutritional food necessary to sustain a healthy lifestyle. Many vulnerable populations are impacted by food insecurity, but one of the most common vulnerable populations and least talked about are young adults who live in rural areas. Some of these young adults are likely to also be college

students. Metropolitan State University of Denver, while located in an urban area, has many students who commute there due to the cheaper tuition compared to the overall rise in educational costs. It is likely that MSU Denver has a rural student population with higher nutritional needs. There is a gap in literature about rural-residing college students impacted by food insecurity, but consistent trends of high young adult food insecurity and rural barriers might indicate that the impacts are even heavier on young adult college students in rural areas. Young adult college students have heavy financial burdens while also receiving less familial financial support; they are also less likely to qualify for federal resources such as SNAP (Patton-López Et al., 2014). Rural Coloradans are more likely to have a higher rate of food insecurity than other areas. COVID exacerbates this disproportionate impact by increasing unemployment rates and reducing food access with stay-at-home orders. Young adult college students are at an increased risk of food insecurity if they've lost their job and displaced from a living arrangement due to COVID-19, which puts them at an increased risk for physical and mental health disorders. Rural-residing college students still have needs and, thus, it is valuable to determine if MSU Denver has been or is able to address this specific population.

Ecological Impacts of Hiking and Other Outdoor Recreation

Braun, Dylan – Corresponding Author

Faculty Mentor: Cooley, Christopher

Major/Research Area: Biology (BIO)/Environmental Science (ENV)

Poster Session 4 (3:30-4:30pm), Poster #5

The year 2020 brought about many changes to our daily lives. With most forms of recreation and relaxation shut down, people took to outdoor recreation in record numbers. A study done using data from the popular hiking app ALL TRAILS reported a 171% increase in the number of hikes logged in 2020 over the previous year. The number of hikers had increased by 134% with hikes per hiker going up over 50%. The impact of the unprecedented crowds on the trails and the environment is not yet known and require further study. Using secondary research, this presentation will explore already collected data to try to answer what some of these impacts may be. The greater the traffic a trail sees, the wider a trail will become. The widening of a trail can lead to a few different outcomes. There is a larger area that is susceptible to erosion from weather and from wear. It can also have a big impact on the plant life adjacent to that trail. Ecosystems in higher elevations are fragile and easily disturbed if trampled. Increased noise and man-made sounds can alter the behavior of animals. Foragers may change their patterns to avoid noisy areas and this may also change the patterns of the predators that hunt them. Increased noise and man-made noises increase the stress levels of animals in the area and, depending on the type of recreation, can be worse than the stress brought on by a predator. Habitats can be ruined by increased traffic as well. People do not always live by the motto pack it in, pack it out. With the increase in people, comes the increase in trash and refuse left behind. As stated before, there will have to be further study on the ecological impacts from the outdoor recreation in 2020, but there are some negative impacts that can be expected.

Decline of Sharks Negatively Impacts Marine Ecosystems: A Review of Trophic Cascades with Emphasis on Behavior

Brown, Timothy – Corresponding Author
Faculty Mentor: Cooley, Christopher
Major/Research Area: Biology (BIO)

Oral Session 3 (2:30-3:30pm), Room 3

This is a review of trophic cascades initiated by the decline of carnivorous sharks in marine ecosystems. Trophic cascade refers to the top-down effects that occur from removal of an apex predator. It refers to an interaction between predator and prey, direct or through risk behavior, that affects multiple trophic levels of the food web. Examples of marine trophic cascades show shark decline initiates mesopredator release which initiates increased consumption of prey species on lower trophic levels. Controversy regarding shark roles in trophic cascades is likely because of the differences between marine and terrestrial ecosystems. Specifically, marine habitat is open to species migration and the species richness, diversity, and trophic radiation are higher in the marine habitats. These differences lead to a heavier emphasis on behavior-mediated trophic cascade (BMTC). Evidence of BMTC has been found in several shark species. Large roving sharks alter foraging behavior in large sea grazers, which in turn, affects seagrass biomass and habitat structure. Enhanced seagrass recruitment alters predator-prey relationships at lower trophic levels. Also, BMTC triggers a change in diet in coral reef mesopredators, which leads to altered community structure. These changes may release coral-eating organisms and may relate to rapid reef collapse. Current research suggests that the shark initiated trophic cascade is highly relevant and BMTC significantly alters local habitat structure and community assemblages. Globally, many species of sharks have experienced significant population decline caused by overexploitation. An unfavorable and incorrect view of sharks may lead to hesitancy or fear rather than effective management of these keystone species. This review highlights the need for enhanced shark research and increased conservation.

Parents' Perceptions regarding Two Intervention Services for Children on the Autism Spectrum

Bunkers, ShayLee – Corresponding Author
Student Co-Author(s): Haydee Cardoza
Faculty Mentor: Santhanam, Siva priya
Major/Research Area: Speech, Language & Hearing Sciences (SLHS)
Additional Tags: Undergraduate Research Mini-Grant Recipient; Community-Based Project

Poster Session 2 (11:00am-12:00pm), Poster #3

School-age children on the autism spectrum and their parents typically receive speech and language therapy and behavior therapy in schools and private clinics. We know very little about collaborations between these two service providers and what parents perceive regarding the services they receive. Therefore, the current study aims at understanding the experiences, and strengths and challenges of speech-language therapy and behavioral therapy as perceived by parents of children on the autism spectrum. This study is participatory in nature – a parent of a school-age child on the autism spectrum is involved in our research team in the planning, data collection, and data analyses phases. We are currently collecting data for the study by conducting an semi-structured interview with parents (mother or father of a school-age child on the autism spectrum). Six English-speaking mothers and one Spanish-speaking mother have participated in the study so far. We will be presenting preliminary results of the

study. The results of this study will provide important information about ways to leverage strengths of individual approaches while planning intervention that supports communication in children on the autism spectrum. The study will also help us understand how we can increase parental involvement in intervention, and facilitate collaboration between speech-language therapists and behavioral therapists.

iOS Smartphone Applications for Geology

Corresponding Author: Cabrera, Julio
Faculty Mentor: Kackstaetter, Uwe
Major/Research Area: Geology

Poster Session 4 (3:30-4:30pm), Poster #6

Modern technology continues to advance in many ways, and many different fields are taking advantage of this advancement. Specifically, the smartphone, these devices continue to improve with every new model which makes them an ideal tool to use in the geosciences. Since the majority of students own a smartphone this would make it a perfect tool for geological field work. When in the field one of the most important tools a geologist has is their Brunton but, what if this could change and instead using a smartphone to take the Bruntons place in the field. It's assumed that your classic Brunton is the best piece of equipment you can have to measure strikes and dips of strata most accurately but what if this was not the case and a smartphone could produce very similar results and maybe better in some situations.

Teletherapy for School-Age Children- A Spanish Resource

Cardoza, Haydee – Corresponding Author
Student Co-Author(s): Estefany Perez
Faculty Mentor: Santhanam, Siva priya
Major/Research Area: Speech, Language & Hearing Sciences (SLHS)
Additional Tags: Community-Based Project

Oral Session 1 (9:30-10:30am), Room 4

The purpose of our project is to inform Spanish-speaking parents of the benefits of teletherapy and to resolve any misconceptions associated with teletherapy. We are also interested in demonstrating communication activities that can be used during a teletherapy session to promote expressive and receptive language in school-age children on the autism spectrum.

As part of this project, we will be developing a brochure that addresses common misconceptions associated with teletherapy. The brochure will be created in Spanish and culturally appropriate terms and recommendations will be provided. In conjunction with the brochure, we will be developing an informational video explaining teletherapy to parents. Additionally, we will be developing lesson plans for 3 different communication-based activities that parents can use to promote expressive language for children on the autism spectrum from Spanish-speaking families. The brochure and lesson plans will be shared during the presentation. Parents of children with a diagnosis of autism, whose primary language is Spanish or bilingual Spanish-English families will benefit from this resource.

This will also benefit speech-language pathologists and teachers who are working through teletherapy with Spanish speaking children and families.

Rapid Detection of Mycoplasmas via E-DNA Biosensor

Chamblee, Christopher – Corresponding Author

Faculty Mentor: Bonham, Andrew

Major/Research Area: Biochemistry (BCHM)

Additional Tags: Undergraduate Research Mini-Grant Recipient

Oral Session 2 (10:45-11:45am), Room 1

Mycoplasma bacteria are nanoscopic (<100 nm in width) organisms that are too small to be detected by most standard light microscopes, yet are responsible for millions of cases of community-acquired pneumonia requiring hospitalization, pelvic inflammatory disease, and other transmissible infections each year. In addition to causing human disease and morbidity, these organisms present a great and growing burden upon eukaryotic cell lines maintained in laboratories. Contamination rates, which are typically in the range of 15-35% of continuously cultured cell lines, have been found in recent studies as high as 65-80%. Current methods of detecting Mycoplasmas, in cultures as well as in patients, are time consuming, rely upon expensive reagents and require equipment that is not widely available. We thus propose a low cost, rapid biosensor capable of detecting two species of mycoplasma bacteria, *M. genitalium* and *M. pneumonia*, through detection of a protein (called P48) that is constitutively excreted by both of these. At the current stage of research, a DNA-based biosensor molecule has been designed and optimized in silico using nucleic acid secondary structure prediction software. However, in order to confirm this design, the target P48 protein must first be produced in genetically transformed *E. coli*. Ongoing work is thus directed at expressing this recombinant protein. Initial efforts to express this protein suffered low yield, so we are currently focused on refining the expression parameters (these include growth media, induction time and temperature, shaker speed, and concentration of induction compound). Following successful expression and purification of the recombinant P48 protein, we will proceed to assess the performance of the DNA-based biosensor through titration with P48 in buffered media. Ultimately, this project should yield a novel means of detection of Mycoplasma.

Black-Tailed Prairie Dog (*Cynomys ludovicianus*) Behavioral Responses to Human Intrusion at Urban and Rural Colonies

Christman, Joseph – Corresponding Author

Faculty Mentor: Cooley, Christopher

Major/Research Area: Biology (BIO)

Poster Session 2 (11:00am-12:00pm), Poster #4

The purpose of this study was to observe the behavioral responses of black-tailed prairie dogs (*Cynomys ludovicianus*) to human intrusion and compare data between two colonies. Video cameras were used to collect behavioral data on prairie dog towns in two separate colonies: one in residential Aurora, Colorado and the other near farming plots in Commerce City, Colorado. It was predicted that urban prairie dogs would show more tolerant behavior toward human intruders compared to their rural counterparts. *Cynomys ludovicianus* are social animals

and utilize their large communities to defend against a large variety of possible predators. Behavioral data was compared with and without human presence and across locations (urban vs rural). Only 2 colonies were approached <12 times over a 4-week period, during the tail end of black-tailed prairie dog breeding season. These results suggest that anti-predator behavioral responses appear to be more sensitive to human intrusion in ecological communities that have more anthropogenic development (urban) when compared to populations more distant from anthropogenic pressures (rural). It is suggested that additional time, material, and sample sets are required to support statistically significant results for anti-predator behavioral response variation based on colony location. This study also raises insight and concerns of current continuing human development and its impact on wildlife and may lead to greater understanding of human and wildlife relations.

Addressing Health Disparities Through Cultural Competency

Cisneros Saucedo, Nayeli – Corresponding Author

Student Co-Author(s): Alejandra Ruiz-Diosdado, Thalia Rodriguez, Monserrat Ariza Torres

Faculty Mentor: Alejano Steele, AnnJanette

Additional Mentors: Karla Horgan Arevalo

Major/Research Area: Psychology (PSY)

Oral Session 3 (2:30-3:30pm), Room 3

The MSU Denver Health Scholars research project features multidisciplinary and interprofessional research on the mental, physical and emotional health of DACA/ Undocumented/ Migrant communities. The team will share their research on the priority needs of these communities, next steps to fill gaps in response, as well as available resources in Colorado. The presentation will provide the whole-person approach to wellness and illness, drawing out key needs representing the perspectives from 10 Health Institute departments. This session will focus on minority populations including those who are undocumented and from the Latinx community. These communities are greatly affected due to the lack of support in education, resources, and cultural competency practices in the healthcare system. For example, these communities may face multiple language barriers, this is demonstrated in situations where the delivery of healthcare results and recommendations for follow-up are misinterpreted. The lack of representation of diverse staff in medical settings can create distrust and restrictions in the healthcare system. In some situations, these restrictions do not allow them to receive and access preventative care, which can worsen symptoms and health conditions. This leads to chronic or fatal health outcomes. Research suggests developing culturally competent policies that include diversity, equity, and inclusion practices can help reduce health disparities and increase health positive outcomes. Health issues for DACA, undocumented and migrants need more attention than ever, and this multidisciplinary report represents the key goals of the Health Institute to revolutionize health in Colorado by breaking barriers, empowering and educating communities, fostering collaboration, and embracing diversity.

The Making of an EP: an Experiment in Home Recording

DeLuccie, Zane – Corresponding Author

Faculty Mentor: Macy, Elizabeth

Major/Research Area: Music (MUS)/Sound and Vision

Additional Tags: Undergraduate Research Mini-Grant Recipient

Oral Session 1 (9:30-10:30am), Room 3

Since the early 1900s, record labels have had a monopoly on both the quality and quantity of popular music. In the age of the internet, we see the recording industry shifting to a “do it yourself” model, enabled by advances in home recording technology. Artists like Chance the Rapper, Macklemore and Billie Eilish prove that making an album on one’s own is not only an accessible way to create music, but also an acceptable way. This begs the question, what does a label do that can’t be done independently in the internet age?

As an artist who has seen the industry from both inside and outside of a record deal, I realize there is only one thing to truly gain from a record deal: opportunity. In developing this creative project, a short album (or EP), I hope to circumvent the need for a label by writing, recording, producing, mixing and mastering my own set of tracks with a proper plan for marketing and release. In doing so, I plan to develop methods to bypass the algorithms of streaming services as a way to reach a larger audience. In making this project, I’ve compiled the best musicians I’ve met in Denver as part of the music community, and enlisted their help to create the strongest set of songs I can as a way to showcase our talents as I work to push these songs to new listeners.

The Body Is: Exploring Embodiments of Pain, Play, and Place(making)

Floarea, Rowen – Corresponding Author

Faculty Mentor: Santos, Stephanie

Major/Research Area: Individualized Degree Plan (IDP)/Gender, Women, & Sexualities Studies (GWS)

Oral Session 2 (10:45-11:45am), Room 3

The body is political. This project pursues two questions. 1) What are the stories we tell about the body? 2) What stories does the body tell? I conducted autoethnographic research in conjunction with a unique research method: skateboarding. Skateboarding offers unique insight into knowledge of and from the body. I aimed to investigate the body, my body, through experiences of pain, play, and place(making). Skateboarding sits at the nexus of these three concepts and offers generative critiques of these experiences and their political materialities. As part of my transgender journey, examining my body through skateboarding in this way offered opportunities to find healing. Healing within myself, my relationships to others, and to the world at-large. This project is in process. The more research and connections that I make, the more ideas and questions I have. In short, it is functioning just as I intended. As a creative element of this project I will be compiling my research “artifacts” into an online visualization. My aim with this is to create an assemblage of embodied knowledge/stories that folks can explore, make their own connections, and add their own artifacts. The function of this piece of the project aims to make a space for bodies to engage in some degree of conversation. And that we might feel less alone.

Life in the Fasc(ist) Lane

Corresponding Author: Gager, Robin

Faculty Mentor: Dhoot, Sonny

Major/Research Area: Gender, Women, & Sexualities Studies (GWS)

Oral Session 2 (10:45-11:45am), Room 3

Since 2016 there has been a growing interest in so-called online hate groups. This was initially a direct result of the 2016 Presidential Election followed up by several incidents of violence at the hands of these hate groups. The existence of these groups was largely attributed to the idea of echo chambers of information on social media platforms. More recent research however has actually refuted that idea. Previous research has focused on individual hate groups and platforms, instead of examining the phenomenon at large, which has led to limited insights on the groups themselves and the ideas connecting them. Using discourse analysis to identify and examine the common themes running between different online platforms known for their hateful rhetoric we were able to determine what ideologies are being advocated for across several platforms. This allowed us to uncover the specific underlying ideology of these online platforms, which allows us to better understand and combat the problem. This underlying ideology is, essentially, fascism as outlined by Umberto Eco. This was uncovered by using an intersectional framework based on the critical race theory presented by Kimberlé Crenshaw and Audre Lorde. In light of this underlying ideology and the theoretical framework used we were able to demonstrate that so-called online hate groups are actually extremely similar to more traditional hate groups. This research also has significant implications for the future of preventing people from falling into these fascist groups. Since the groups can be understood as both fascist and the natural result of systemic modes of oppression we can begin to create techniques to fight against them. This is important because past attempts to fight against these groups and the violence that comes from them have been largely unsuccessful.

Research Plan: Coping During COVID

Gibbs, Cassie – Corresponding Author

Faculty Mentor: Erickson, Cynthia

Major/Research Area: Psychology (PSY)

Additional Tags: Undergraduate Research Mini-Grant Recipient

Poster Session 1 (9:45-10:45am), Poster #5

This study will be the second round of a Coping During COVID study done by the MSU Psychology Research Club to continue looking at the effects of COVID in later stages. The poster will cover our research plan and previous research. The pandemic caused by the spread of COVID19 is an event unlike any that most people have experienced in their lifetime. As a result, the mental health of people across the world will be challenged. Concerns around heightened stress, anxiety, depression, and many other negative psychological constructs are growing daily. Coping mechanisms, behaviors, and strengths are being called into question by even those who consider themselves most adept. As psychologists, we believe it is imperative to gather information on people's psychological health, coping, and resiliency while in the midst of this crisis. It is also important to gather data that could help us to react quickly with interventions and to measure longitudinally the effects of the crisis. For this purpose, it is our intention to reach out to our community and gather data that can help us to answer questions such as: What trends are we seeing among the general public regarding anxiety, depression, stress, psychological flexibility, traumatic growth, contamination fear? How is this pandemic changing the way people cope? What types of coping behaviors are most prominent among those who are displaying less anxiety? What types of coping

behaviors are new and related to quarantine or other new contexts specific to this pandemic? What are the generational impacts of the pandemic regarding trauma, anxiety and financial fear? Who is taking the most risk and what factors are influencing risk taking behaviors? Are there social, psychological, or individual characteristics that moderating the relationships of these variables? Our objective is to gather a wide breadth of data around psychological constructs that can be used to answer these questions and more.

Prevention of Disease in the Immigrant Community Through Physical Wellness

Gomez-Corona, Marcos – Corresponding Author
Student Co-Author(s): Lauren Peraza, Maria Vidal Castro, Monica Vargas-Mejia
Faculty Mentor: Alejano Steele, AnnJanette
Major/Research Area: Exercise Science (EXS)
Additional Tags: Community-Based Project

Oral Session 3 (2:30-3:30pm), Room 2

The MSU Denver Health Scholars Research Project is focused on exploring health issues in the immigrant/undocumented community through the use of scholarly research. Research from the ten Health Institute Programs will help explore and point out health issues and disparities in the immigrant/undocumented community that are not well known. Acknowledging these barriers is only the first step towards progress or bringing awareness to the obstacle's immigrant communities face. This presentation will explore the issues in a solution-oriented approach by outlining the key steps that can be taken towards minimizing inequalities and creating more awareness in the overall community.

This team will be covering four topics related to the impact of physical health on the wellness and prevention of disease in the undocumented/immigrant community. These topics will be covering stress and obesity, physical activity and education, nutrition, and cervical cancer.

Raised by Music

Corresponding Author: Gussenbauer, Devyn
Faculty Mentor: Macy, Elizabeth
Major/Research Area: Music (MUS)
Additional Tags: Undergraduate Research Mini-Grant Recipient; Community-Based Project

Pre-recorded Oral Session 4 (3:45)

My mission is to support the business, community and future of Denver's exuberant music culture during these economic hardships of COVID-19. Through this event called Raised by Music, I will be connecting local venues, musicians and a nonprofit The Boys & Girls Club of Metro Denver to put on a professional quality video recorded performance and it will be accessible to all people. The intended impact of this performance is to present the idea of using music to raise money for local non profits to both unify music and community to highlight the importance music has on our lives and how we need the publics help more than ever to keep music a part of our communities and economy.

I want to exercise forward thinking in our local music scene during COVID-19 and put this mission into action in the future as a live performance event to demonstrate the importance of keeping our music culture alive, connected and doors open no matter the difficulties in today's pandemic.

TRIO Scholar Research Study

Guzman, Syntya – Corresponding Author

Co-Author: Valeria Castaneda Saucedo

Faculty Mentor: Koppel, Lauren

Additional Mentors: Eric Silva

Major/Research Area: Sociology (SOC)/Education (EDU)

Poster Session 1 (9:45-10:45am), Poster #2

This study is intended to further understand the meaning of success for TRIO scholars and to encourage students to apply for grants and scholarships. It is also intended to help better serve students in ways they need. The questions we are trying to answer through this study are: What does success mean to college students who identify as first-generation, low-income, and/or with a disability? How does this definition of success impact their college experience? How will this definition influence their choice of applying for grants and/or scholarships? This study consists of potentially 200 TRIO participants at MSU Denver. Participants are asked what their personal definition of success is and if they have applied for any grants or scholarships, through a questionnaire. A certain number of selected participants will be divided into two focus groups, which will then be asked more in depth questions about their definition of success and their experience with applying to grants and scholarships. Although there is not definitive final findings at this moment, it is hopeful that the results will offer encouragement for students to apply for grants and scholarships. As well as, knowledge on what student believe success is associated with. Lastly, we hope this study will help the TRIO SSS, and Scholarship and Retention Center at MSU Denver find different ways to support these scholars.

Social Support Before and During COVID-19 in College Students

Held, Sierra – Corresponding Author

Student Co-Author(s): Cassie Gibbs, Phillip DeDionisio, Elizabeth Malagisi, Izana Milstead,

Morgan Slaski, Luke Tisley

Faculty Mentor: Erickson, Cynthia

Major/Research Area: Psychology (PSY)

Poster Session 1 (9:30-10:45am), Poster #4

Due to social distancing and lockdowns during the COVID-19 pandemic, accessing social support may have become more difficult. Previous research on loneliness during the COVID-19 pandemic and college students found a strong link between social support and loneliness. Additionally, research found lower rates of perceived social support with women than men. Introductory psychology students (N=379) completed a survey on Coping During COVID. Social support was measured using the Oslo Social Support Scale (OSSS-3). The three-question scale was modified to provide a before and during COVID response.

There was a significant reduction for all participants $F(1, 377) = 24.09, p < .001$.

There was an interaction between gender and level of social support $F(1,377) = 4.37, p = .04$.

Women reported greater reductions in social support than men. This effect can be contributed to women's higher perception of social support before COVID.

There was no main effect of gender. $F(1, 377) = 1.77, p = .18$.

If social support is reduced, we expected an increase in perceived stress. We examined overall perceived stress before and during the COVID-19 pandemic. As part of a larger study, data was collected before COVID-19 from September to December of 2019 (N=88) and after the onset of COVID-19 from April to December of 2020 (N=333). Both sets of participants were asked to complete an online survey with questions about overall perceived stress. Overall stress was measured using the Perceived Stress Questionnaire (PSQ). A t-test was performed to compare pre-COVID and COVID responses ($t(419)=-1.28, p = .20$). No significant difference in perceived stress was found. A t-test was also run to compare our baseline sample to normative data ($t(316)=3.52, p < .001$). Perceived stress was significantly higher in our sample compared to normative data. Our sample did not show an increase in stress, possibly because college students have already hit a baseline of stress. College students are facing a number of stressors including developing new relationships, leaving home, taking on student debt, holding down jobs, and changing social roles.

Implications for these findings include the importance of providing more access to social support for college students when individuals cannot always meet face to face. Finding ways to connect students with other students during more socially distanced times may be important in negating loneliness. Additionally, providing virtual women-based support groups could be valuable in opposing women's perception of greater loss in perceived social support.

The Musician's Personality: Do Personality Traits Vary According to Ensemble Membership?

Corresponding Author: Heydel, Zahava

Faculty Mentor: Smith, Randyl

Major/Research Area: Psychology (PSY)

Additional Tags: Undergraduate Research Mini-Grant Recipient

Poster Session 1 (9:30-10:45am), Poster #3

This study aims to determine if there are predicting or differing personality traits of classical and jazz musicians utilizing a big five personality inventory. 221 musicians completed the Big Five Inventory (BFI) and a short demographic survey. A logistical regression and ANOVA were conducted to determine predicting personality traits and differences between jazz and classical musicians. There were no significant differences between personality and music ensemble membership. However, low conscientiousness and high agreeableness scores are predicting personality factors for being a jazz musician. High conscientiousness and high neuroticism scores are significant predictors of being a classical musician. This data has filled the literature gap concerning whether musicians' personalities differ based on their music ensemble membership. These results will aid music directors in cooperation, instruction, and communication with their ensemble.

Childhood Adverse Experiences (ACEs) Impact on Metabolic Disorders in Adults: A Literature Review

Heydel, Zahava – Corresponding Author
Faculty Mentor: Smith, Randyl
Additional Mentors: Noy Phimphasone-Brady
Major/Research Area: Psychology (PSY)
Additional Tags: Earn and Learn

Poster Session 3 (2:15-3:15pm), Poster #5

Every year, approximately 700,000 children experience abuse in the United States (National Children’s Alliance, 2019). In the literature, traumatic and stressful childhood experiences are referred to as adverse childhood experiences (ACEs). ACEs can be thought of as an umbrella term to encompass childhood experiences of physical abuse, emotional abuse, sexual abuse, emotional and physical neglect, and household dysfunction (substance abuse, mental illness, and criminal behavior of someone in the household; domestic violence; divorce or separation of parents). Research in recent years has focused on how trauma experienced in childhood impacts adult physical health, including metabolic disorders. This literature review discusses how biologically, socially, and psychologically ACEs are related to the development of an adult diagnosis of metabolic syndrome, type 2 diabetes, and polycystic ovary syndrome. Future research directions are also highlighted.

Assessing the Effectiveness of Learning Styles in College Students

Hobbs, Sara – Corresponding Author
Student Co-Author(s): Morgan Slaski
Faculty Mentor: Erickson, Cynthia
Major/Research Area: Psychology (PSY)
Additional Tags: Research project as teaching assistants

Oral Session 3 (2:30-3:30pm), Room 2

Beliefs about learning styles are deeply ingrained in our culture and education system. Many people, from pop-psychology writers to educators and learners, often insist that they learn better when taught in their preferred learning style, claiming to be a “visual” or “verbal” learner. However, research on learning styles has questioned the accuracy of these beliefs and whether students truly learn best when taught in their preferred learning style.

The goal of our research is to assess the effectiveness of teaching materials targeted at students’ preferred learning style on learning and retention. Do visual learners learn better when taught in a visual format and verbal learners in a verbal format? To answer this question, we created an online survey that explored how well participants learned when presented with these two different learning-style tailored instructional methods. Each participant was randomly assigned a learning block containing two verbal, text-based lessons and two visual, graphics-based lessons from four possible blocks. Each block contained either a visual or verbal version of all four topics. These diverse subjects include classical conditioning, conservation, photosynthesis, and toilet function. Participants answered questions about their perceived learning style preferences. and also solved 25 visual reasoning puzzles. The puzzles created a buffer between the study lessons and assessment questions, as well as provided a measure of reasoning ability. Finally, participants answered questions to assess their retention of the material presented in the study lessons. This study design allows us to compare retention of material when the participants’ preferred learning style matched the study material vs when there was a mismatch between preferred learning style and study material.

This research has multiple implications for educators and learners alike. Understanding how students respond to teaching materials tailored to different learning styles will help assess the effectiveness of learning-style based teaching. This can help educators to better direct their efforts and serve students more effectively while avoiding unnecessary time spent on ineffective, unproven teaching methods. Educators may already be expending enormous effort on learning styles-based teaching, despite a lack of empirical evidence for this approach.

Common Sense Water-Conservation

Ingersoll, Branden – Corresponding Author

Faculty Mentor: Foust, Christina

Major/Research Area: Communications Studies (CAS)

Oral Session 2 (10:45-11:45am), Room 3

The world is running out of water. Fast. By 2050, it is estimated that more than 4.5 billion people (nearly half the Earth's population), including many in the United States, will be facing extreme water scarcity. You may not know it, but the U.S. relies on a myriad of 204 fresh water basins for everything from agriculture, to industry and personal use. Of those 204 basins, 96 are expecting significant shortages by 2050, and 83 (the source of more than 40 states current water supplies), are expected to have extreme shortages as early as 2021. A startling scenario to consider, especially when assessed in conjunction with the reality that Big Agriculture in the U.S. alone is responsible for an astounding 80-90% (or 34 trillion gallons) of all annual groundwater consumption. A staggering amount that currently is expected to increase by up to an additional 60% by 2030. Given that rhetoric has a storied history of serving as an impetus to social change through its ability to motivate audience members to take action in order to alleviate a given exigency, digital advocacy portfolios (DAPs) are integral components of the quest for institutional change. As such, in response to encroaching global social instability induced by the decimation of freshwater supplies, this digital advocacy portfolio examines resource intensive agricultural practices while highlighting potential avenues of improvement that could be taken to conserve remaining resources. Specifically, this DAP outlines a blueprint for potential legislative changes that could be made to existing agricultural subsidy programs so as to fund nationwide a transition from conventional industrial agricultural systems to large-scale, vertical hydroponic cultivation centers; advanced facilities that satisfy quotas yet only require fractions of the resources needed by conventional practices.

The Efficacy of Store-Bought Epoxies on Petrographic Thin Sections

Jensen, Eric – Corresponding Author

Faculty Mentor: Kackstaetter, Uwe

Major/Research Area: Applied Geology

Oral Session 3 (2:30-3:30pm), Room 1

The usage of epoxies in petrographic thin sectioning is a necessity and there are many petrographic epoxies, but most are expensive for the volume provided. An alternative that is cheaper but just as effective would save money and time for the companies and private parties that use this process. Thin sections would have to be made for each of the 20 epoxies that were gathered. Each of the samples of Dacite on the slides being 30 microns in thickness. One being Hillquist, a professional epoxy, and the rest being epoxies that were purchased from

Amazon.com and could be easily purchased at hardware stores, grocery stores, and craft stores. Hillquist is being used due to ease of acquisition as it is the epoxy used at Metropolitan State University of Denver. There are other petrographic epoxies such as Pertropoxy 154 and EMS petrographic epoxy, but all have similar optical properties ranging from a refractive index of 1.533 to $1.540 \pm .001$. If the store-bought epoxies are close in refractive index, an alternative could be proposed. Another need is the epoxy's innate strength. This could be tested using the normal process of thin section creation as it is strenuous to an epoxy. The last need is a cost table that relates the cost of product by volume and its physical and optical properties.

Morphological Segmentation of Carbon Nanotube Imaging Data

Johnson, Thomas – Corresponding Author

Faculty Mentor: Avery, Azure

Additional Mentors: Shahar Boneh

Major/Research Area: Physics (PHY)

Additional Tags: Advanced Physics Lab I

Oral Session 3 (2:30-3:30pm), Room 1

Atomic force microscopy and TRMC (time-resolved microwave conductivity) have been used to measure the physical topology and conductivity of single-walled carbon nanotube bundle networks. To better understand how physical features within these networks affect conductivity, establishing correlation between TRMC measurements and the physical structure of these samples is required. However, doing so is a time-consuming and error-prone process when performed manually. An automated method to identify intersections, segments, feature area, and other characteristics of both nanotube and arbitrary fibrous networks is described and shown to be a viable technique in analysis of high-level features within sparse synthetic and real AFM height-map data.

Autistic College Students: The Need for Peer Understanding

Lee, Nadine – Corresponding Author

Faculty Mentor: Santhanam, Siva priya

Major/Research Area: Speech, Language & Hearing Sciences (SLHS)

Additional Tags: Community-Based Project

Poster Session 2 (11:00am-12:00pm), Poster #2

Students on the autism spectrum are increasingly pursuing higher education. Despite demonstrating academic strengths, many students face challenges in two main areas: (1) social isolation, and (2) stigma associated with an autism diagnosis. Autistic students are often rated as awkward, less attractive, and less likeable by non-autistic peers. Additionally, non-autistic students tend to confuse autism with other learning disabilities demonstrating limited characteristics specific to individuals on the autism spectrum. Increased autism knowledge improves social outcomes for college students on the autism spectrum and reduces misunderstanding and miscommunication between autistic and non-autistic peers. The need for increased autism knowledge is crucial for students in healthcare majors as they will be facing autistic clients in their future clinical practice. In this poster presentation, we compare how autism is viewed through the medical and social models of disability, and discuss the implications for students in healthcare majors. We will also describe autistic stigma and it can impact the social, academic, and

emotional well-being of students on the autism spectrum. We will share specific strategies on how to encourage and promote peer interactions between autistic and non-autistic college students. We hope that the audience will obtain a better understanding of autism and individuals on the autism spectrum through this presentation.

Telepractice for School-Aged Children

Lofthus, Madison – Corresponding Author

Student Co-Author(s): Laura Kessler, Janine Turner, Thomas Bohan

Faculty Mentor: Santhanam, Siva priya

Major/Research Area: Speech, Language & Hearing Sciences (SLHS)

Oral Session 1 (9:30-10:30am), Room 4

With virtual healthcare on the rise, professionals in the fields of Audiology and Speech-Language Pathology must adapt to many changes. Speech-language pathologists assess, diagnose, and treat communication disorders in children and adults. In this service-learning project, our objective is to address common misconceptions regarding telepractice for children in school settings by creating an informational video and brochure. In addition, we are presenting lesson plans, and interactive virtual activities for a speech-language pathologist to utilize during intervention. These materials address receptive and expressive language to increase communication skills modeled by the following sample client, Kelsey.

Kelsey is an 8-year-old girl with Down syndrome who was born with mild intellectual disability and damage to the nerve pathways in her inner ears, resulting in a congenital sensorineural hearing loss. Additionally, Kelsey acquired a conductive hearing loss from recurring ear infections, impacting her middle and outer ears. These hearing challenges resulted in a mixed-hearing loss. A mixed-hearing loss results from damage to both the inner and middle parts of the ear, and the severity of her hearing impairment is the same in each ear. She has some difficulty hearing low frequency sounds, such as /b/ and /g/, and more difficulty hearing higher frequency sounds like /s/ and /z/. To improve the loudness and quality of the speech sounds she hears, Kelsey was fitted with behind-the-ear (BTE) hearing aids in both ears at the age of three.

Early hearing loss combined with intellectual disability led to difficulties in comprehending and producing speech sounds needed for reading and communication. Problem-solving, following directions, and focusing are challenging for Kelsey. It is often very difficult for others to understand what she is saying, making it hard for her to form relationships with classmates. Consequently, social skills and interactions are challenging for her. Currently, Kelsey is using American Sign Language (ASL) to support her communication development and to convey her needs and wants. One of the main goals of Kelsey's communication intervention is to promote her understanding and use of language through either speech or ASL.

Deconstructing Ableism: Being an Agent for Change

McCurdy, Jacqueline – Corresponding Author
Student Co-Author(s): Jeanne Erker, Katie Lowry, Cassie Thornton
Faculty Mentor: Santhanam, Siva priya
Major/Research Area: Speech, Language & Hearing Sciences (SLHS)
Additional Tags: Service Learning

Oral Session 1 (9:30-10:30am), Room 4

This service-learning project aims at increasing understanding of ableism among students in healthcare majors while also helping us recognize ableist tendencies within ourselves, our workplaces, our university, and our society as a whole. Through this project, we hope to both educate non-disabled individuals and advocate for our disabled peers. As part of this service-learning project, our team has developed the following resources: (1) an annotated bibliography on current research on ableism, (2) an essay that explains the association between bullying and ableism, and how we can address educate children about ableism, (3) a collection of children's literature and a description of how disabilities have been addressed in these children's books, and (4) a brochure that helps create awareness on ableism and discusses possible solutions to address ableism. As healthcare majors we need to be aware of our own ableist tendencies to reduce both implicit and explicit bias toward disabled individuals and to prepare ourselves for clinical service roles in the future. By working together, we can begin to create a community that is inclusive and valuing of all individuals.

Bat Species Richness, Diversity, and Behavior in Urban Park Locations

Mckee, Kealia – Corresponding Author
Faculty Mentor: Cooley, Christopher
Major/Research Area: Biology (BIO)
Additional Tags: Senior Experience Project

Poster Session 3 (2:15-3:15pm), Poster #2

There have been numerous studies conducted on the effects of urbanization on the populations of different organisms. Many have found a correlation between urbanization and lowered population size, diversity, species richness, and changes in behavior. However, there have not been many studies on urban parks and their effects on organisms in urban environments. The purpose of my study is to examine if urban parks in Colorado can be used in conservation efforts to provide a sustainable ecosystem for bat species.

Classmates and I collected data over a two-month period in 2019 using an Echo Meter Touch 2 from Wildlife Acoustics. This device allowed us to gather echolocation calls to analyze the time, location, and frequency of bat calls, and note the presence of different species. In order to see the effects of urbanization, three different urban parks in Colorado were studied: Fox Hill-Centennial (least urbanized area), Washington Park-Denver (moderate level of urbanization), Sunkin Gardens-Downtown Denver (heavily urbanized).

Results will be graphed to compare the prevalence and behavior of bats in different parks, and analyze their diversity in different urban environments. The averages of activity periods, first call, and number of bats recorded for each night will be compared. Data for species diversity from each park will be run through a program called Past v3. This program provides alpha diversity, beta diversity, diversity t-test and Shannon values. Finally, the

species of bats observed at the urban parks will be compared against data collected in Mesa Verde National Park, which is a natural bat habitat.

Dynamics of Cooperative Feeding in Northern Shovelers

Meek, Kaily – Corresponding Author

Faculty Mentor: Carello, Christy

Major/Research Area: Biology (BIO)

Additional Tags: Undergraduate Research Mini-Grant Recipient

Poster Session 1 (9:45-10:45am), Poster #6

Northern Shovelers *Spatula clypeata* are often seen making a circling motion in large groups in the nonbreeding season. This event has been described as pinwheeling, spinning or circling and is likely a feeding behavior. In our research, we investigated the environmental conditions that result in this behavior, how many individuals are generally involved in the behavior, the social demographics of the behavior and if this behavior is a form of cooperative feeding. This study was conducted October 2020 to February 2021 at Prospect Park in Wheat Ridge, CO at two large lakes; Prospect Lake and Tabor Lake. Digiscoping using either a spotting scope from the shore or a drone from above. Data was extracted from each video session in 30 second increments by freezing the video frame. Total number of birds, sexual and developmental stage, and feeding and agonistic behavior were recorded in a spreadsheet. We found that circling group size ranged from 2 individuals to over 140 individuals. No specific demographic patterns were detected. In addition, we did not find any agonistic behavior and a very high percentage of feeding behavior. Our research suggests that Northern Shovelers are feeding cooperatively and that there is no social hierarchy involved. In addition, we found that the majority of this behavior was found at only one of the lakes in our study, Prospect Lake. Prospect lake is significantly shallower than Tabor Lake. This feeding behavior may be driven by Northern Shovelers requiring a higher caloric intake compared to other similarly sized waterfowl. Cooperative feeding may maximize caloric intake while reducing energy expenditures.

A Gentle Robot: Biomimicry Innovation

Mikhaylova, Svetlana – Corresponding Author

Faculty Mentor: Bechtold, David

Major/Research Area: Management (MGT)/Entrepreneurship

Oral Session 3 (2:30-3:30pm), Room 3

Seeking inspiration from nature to develop more efficient, safe and sustainable products is the main principle behind biomimicry. For instance, countless workers have been injured working with heavy, rigid machinery at manufacturing plants. In an effort to develop safer, more practical equipment engineers have turned to nature for ideas. They observed that an elephant's trunk is a powerful tool consisting of nearly 40,000 muscles and no bones which allows it to twist and maneuver in a very meticulous manner. Inspired by the flexibility and resiliency of this impressive appendage, engineers have developed a 3-dimensional robotic arm that is capable of performing a wide range of precise motions while being energy-efficient and easy to manipulate. The Bionic Handling Assistant, they called it, created a solution to not only foster safer working conditions in factories but also proved to be useful in laboratories and hospitals. Festo, the German company behind the invention, earned the 2010 German Future Award for their creativity. They continue to utilize their study of the planet and natural habitat to invent

dynamic, multi-functional technologies of the future. They have become a world leader in the field of automation and technological education, with over 21,000 employees and offices in 61 countries. They have aptly demonstrated that biomimicry is the future of product design. In nature everything works in tandem, with efficiency being maximized while waste is reused and recycled. Learning from the intelligent, self-sufficient systems that exist in our environment is the key to crafting tomorrow's groundbreaking technologies.

Modeling Iron Reductase CG8399: One protein domain at a time

Murphy, Laura – Corresponding Author
Faculty Mentor: Ragan, Emily
Major/Research Area: Biochemistry (BCHM)

Poster Session 4 (3:30-4:30pm), Poster #2

In organisms ranging from prokaryotes to humans, iron is involved in many physiological processes from energy metabolism to neurotransmitter synthesis. Despite this necessity, the oxidation state of iron must be tightly regulated in order to avoid dangerous cellular damage from iron (II) through the Fenton reaction. Proteins containing a cytochrome b561 domain play a role in electron transport and iron reduction. One such protein in *Drosophila melanogaster*, CG8399, has previously been found to function as a ferric reductase when expressed in *Xenopus* oocytes, suggesting that it plays a role in the regulation of iron homeostasis. Through BLAST searches, we identified orthologs of CG8399 in all eight insect species we investigated. We hypothesize that insect CG8399 orthologs play an important role in iron homeostasis. CG8399 and its orthologs differ from other cytochrome b561 family members because they contain three domains: reeler, DOMON, and cytochrome b561. Little is currently known about the functions of the reeler and DOMON domains in CG8399, but conclusions can be drawn from other proteins containing reeler and DOMON domains such as F-Spondin and Dopamine Beta Hydroxylase (DBH). We explored structures of the reeler, DOMON, and cytochrome b561 domains of 8399 through homology modeling. In addition, we used motif analysis and multiple sequence alignments to determine key similarities and differences between the 9 insect sequences and other related proteins.

“kissing white boys”: Exploring LGBTQIA+ Relationships in Pop Music

Noriega, Mario – Corresponding Author
Faculty Mentor: Macy, Elizabeth
Major/Research Area: Music (MUS)

Oral Session 1 (9:30-10:30am), Room 3

This creative project will focus on the discussion, history, and importance of non-heteronormative relationships in pop music as seen through my work as musical artist blas. Born and raised in Denver, from a very young age I knew my purpose in life had something to do with music. I've spent my entire life singing, began piano lessons at 12, and taught myself how to write music by listening to artists like Chavela Vargas, The Smiths, Tupac, Paul Anka, Whitney Houston, and Ella Fitzgerald. My most recent projects address the reality of LGBTQIA+ relationships. My aim in presenting this work is to normalize the discussion of true/real non-heteronormative relationships and stories in music and to use songwriting as a tool towards acceptance.

Divided into two main parts, I begin by discussing my mini quarantine demos, which were developed and realized during the isolation of quarantine brought on by the global pandemic in March 2020. All of the visuals, recording, and production for these demos took place in my room, as seen in the song “bee in my soda can.” Next, I turn to my second and most current project, peach (2021 EP), a conceptual pop album that discusses the beauty and ugly truths of a gay juvenile relationship. Some themes scattered about the project are loss of self in order to obtain love/acceptance, facing and or hiding from scrutiny, acceptance of self, challenging what is masculine/feminine, history of representation, and repression of the LGBTQIA+ community. Each of these themes are present in my second musical example, “kissing white boys.” These concepts were important for me to discuss because I feel like there are times where there is a lack of representation and even unfortunately a stigma when it comes to non-heteronormative narratives in popular music and media. As a person of color and as a member of the LGBTQIA+ community I feel a need for my voice to be heard and my stories to be told especially in pop music.

Nemy-related Proteins: Putative Ferric Reductases in Insects

Nuñez Sifuentes, Karen – Corresponding Author

Faculty Mentor: Ragan, Emily

Major/Research Area: Biochemistry (BCHM)

Poster Session 4 (3:30-4:30pm), Poster #1

Iron is essential to many physiological processes such as the electron transport chain, cell division, DNA repair, and neurotransmission. However, iron is also toxic. Although many studies have been done to better understand iron uptake in mammals, pathways of iron uptake in insects are still unclear. Cytochrome b561 proteins are integral membrane proteins containing two heme molecules that may be involved in iron uptake because they are suggested to transport electrons across membranes. We hypothesize that ferric reductases play an important role in cellular iron uptake in insects, reducing ferric iron (Fe³⁺) to ferrous iron (Fe²⁺). The ferrous ion could then pass through a membrane transporter into the cell. Currently our group is conducting a phylogenetic analysis of cytochrome b561 family members in nine insect species. One of the four distinct cytochrome b561 one groups we identified in our phylogenetic tree includes CG8776 (nemy) from *Drosophila melanogaster* and closely related proteins in seven other insect species. Of those, a long nemy-like sequence also including a DOMON domain was found in the pea aphid, *Acyrtosiphon pisum*. I performed BLAST and sequence analysis and determined similar long nemy-like proteins are only found in other aphids. To investigate if nemy is a ferric reductase, we will perform RNAi knockdown of nemy in Sg4 cells. I will describe initial steps in this process, starting with ordering a plasmid with a nemy sequence from the *Drosophila* Genome Research Center and using it as a template for PCR amplification of a >500 bp region of nemy. Ultimately, a better understanding of iron uptake in insects may lead to insights that deepen understanding of iron diseases in humans, while pathways found to be unique to insects could be targets for new insecticides.

Maternal guilt and shame related to education choices for children during COVID-19

Nussbaum, Rachel – Corresponding Author

Student Co-Author(s): Michelle Kravets

Faculty Mentor: Fleck, Bethany

Major/Research Area: Human Development and Family Studies (HDV)

Additional Tags: Undergraduate Research Mini-Grant Recipient

Oral Session 3 (2:30-3:30pm), Room 2

During spring of 2020, the COVID-19 pandemic forced schools across the nation to close, providing an unusually, rare opportunity to study maternal guilt and shame around specific decisions regarding children's education. In the fall of 2020, options around education began to reemerge and the decision was a difficult one for parents to make. Four potential choices existed; remote learning, face-to-face learning, a hybrid of the first two options, or homeschooling. Because the stresses of the COVID-19 pandemic have been particularly hard on mothers this study seeks to better understand their specific levels of maternal shame and guilt they face around this education related decision.

Guilt can be defined as a moral emotion that can cause or repair harm in others, and it focuses on wrongful behavior and its effect on another (Rotkrich & Janhunen, 2010). Shame is a self-directed emotion that causes oneself to view themselves from an external perspective and is taken as more of an overall negative self-evaluation (Liss, et al., 2013; Rotkrich & Janhunen, 2010). Unfortunately, this has been accepted into many facets of motherhood and is experienced by working and staying at home mothers alike (Liss et al., 2013). There is extensive research on maternal guilt and shame and how it pertains to many aspects of life for mothers (see Miller & Strachan, 2020; Sirois et al., 2019; Liss et al., 2013; Slobodin et al., 2020; Prikhidko & Swank, 2018). This study is building off this body of literature by investigating an unprecedented stressful time to be a parent, as well as the important decisions mothers have had to make about their child's education.

This study utilized an online survey with word of mouth and snowballing participant recruitment techniques. The survey asked about maternal guilt and shame, depression, health locus of control, COVID-19 anxiety, parental stress and self-efficacy, demographics, and questions about the educational choices that mothers made. Three hundred and thirty-nine mothers from across the country participated.

While survey results are still currently being analyzed, preliminary analyses indicate high levels maternal guilt ($M = 17.98$, $SD = 3.97$) and moderate levels of maternal shame ($M = 14.71$, $SD = 4.58$) across all participants. There are strong positive correlations between guilt and shame and mothers depression, COVID-19 anxiety, parental stress and self-efficacy. A detailed correlation matrix will be presented as well as a more nuanced analysis.

A Comparison of Soil Nutrient Cycling between Emergent Palustrine and Riparian Wetlands

Otillar, Aaron – Corresponding Author

Faculty Mentor: Schliemann, Sarah

Major/Research Area: Environmental Science (ENV)

Poster Session 2 (11:00am-12:00pm), Poster #1

Wetland ecosystems create unique conditions for the Nitrogen, Phosphorus, and Carbon cycles. One primary function of wetland ecosystems is providing unique biogeochemical conditions for nutrients to cycle between various forms. The primary factor that influences a wetland's efficiency at cycling nutrients is its hydrological regime. Hydrology can influence the amount of available nutrients, the environment in which the chemical reaction takes place, and the export of chemical products. Wetland soils serve as the primary reaction centers for the major biogeochemical cycles in these ecosystems, and are heavily influenced by the hydrological regime. This study investigates the influence of hydrological regime on wetland soil nutrient cycling. Two different types of wetlands were studied, Emergent Palustrine and Riparian wetland types located in Boulder County Colorado. Soil and water were gathered along transects from the primary surface inflow towards the center of each wetland, to characterize how nutrient quantity changed. Nitrate, Ammonia, Potassium and Orthophosphate levels were measured in soil and water in both wetlands. The results of this study will help to characterize how varying hydrological regimes influence nutrient cycling in wetland environments. This comparison may assist in the understanding of the effects of wetland type on nutrient availability and cycling.

Frequently Asked Questions & Myths About Autism Across Cultures

Perez, Bianca – Corresponding Author
Student Co-Author(s): Kylie Morris, Vesta Attakora
Faculty Mentor: Santhanam, Siva priya
Major/Research Area: Speech, Language & Hearing Sciences (SLHS)

Oral Session 2 (10:45-11:45am), Room 2

The video project is a compilation of frequently asked questions about autism spectrum disorder from different cultures and communities. The project includes three authors that are from different cultural backgrounds and the video is composed of different languages including English, Twi, and Spanish in an attempt to access a larger audience. Individually, the authors asked, "what do you wish you knew about autism?" to their respective communities on social media platforms, as well as their family and friends. Although the authors pertain to distinct cultures, there are a lot of common myths and misconceptions that still surround autism across cultures and communities. The most common questions are addressed in the video project. Along with addressing the questions, they also target the myths that are specific to each individual culture and community to raise awareness in the general population. The questions were answered by extracting information from the most recent research studies and articles as well as background knowledge from speech, language, hearing sciences courses, and the interactions with the autism community in the ISSAC program (Integrated Supports for Students with Autism in College). The intent is to have a video resource that can be utilized by not only the speech, language, and hearing sciences department and students, but also any person that has a connection with someone on the autism spectrum, special educators, or anyone that is interested in learning more about the spectrum. The ultimate goal of the project is to diminish stigmas and misconceptions surrounding autism spectrum disorder across cultures and communities.

Investigating Self-Similar Properties of Urban Systems Utilizing Fractal Geometry and Dynamical Systems

Peterson, Ryan – Corresponding Author

Faculty Mentor: Niemeyer, Robert

Major/Research Area: Statistical Science/Mathematics (MTH)

Poster Session 2 (11:00am-12:00pm), Poster #6

The application of mathematics to social issues, such as inequality, has the potential to quantify, predict, and prevent the worst impacts on the personal and social well-being of people and communities. By focusing on the greatest concentration of social interaction, urban systems, we hope to successfully apply mathematical principles to important social issues. Although challenging, we believe it is possible to quantify interactions within cities by identifying self-similarity scaling properties that emerge from complex social interactions. Shapes exhibiting what is called self-similarity are typically regarded as fractal shapes. When a shape is self-similar, it exhibits scaling properties, therefore mathematical methods related to fractals can be applied to urban systems. Certain quantities of a city naturally grow at a lower rate with regards to city population while other quantities naturally grow at a faster rate when compared with the population. When such economies of scale are not observed in a city (whether sublinear or superlinear growth models), one tends to find a city in, for example, a poverty trap. The main goal of this project is to describe these economies of scale and emergent properties through the lens of fractal geometry and dynamical systems. Further goals are to better articulate conditions under which these scaling properties can be identified and how they interact with known sociological theories.

Bioinformatic analysis of allele-specific DNA methylation and expression patterns in multiple cancer cell-lines

Poch, Dylan – Corresponding Author

Faculty Mentor: Bonham, Andrew

Major/Research Area: Chemistry (CHE)/Biochemistry (BCHM)

Additional Tags: Undergraduate Research Mini-Grant Recipient

Oral Session 2 (10:45-11:45am), Room 1

Epigenetic regulation is becoming unambiguously linked to a variety of human maladies including cancer. However, there is a paucity of information linking allele-specific DNA methylation for heterozygous genes to association with cancer progression. Previously, our lab researched the allele-specific epigenetic regulation of Telomerase reverse transcriptase (TERT) across over 800 cancer cell lines. Results were indicative of biallelic expression in the proximal promoter region of TERT and revealed canonical CpG hypomethylation, but also revealed the prevalence of monoallelic gene expression in cancer cell lines.

Expanding upon that work, our lab is developing a python-based program, Pyllelic, that analyzes the epigenetic expression and allelic expression of a diverse array of genes linked to cancer progression. Data obtained from bisulfite sequencing stored in Binary Alignment Map (BAM) files are aligned and parsed using Pyllelic. The program incorporates an application called QUMA (quantification tool for methylation analysis) to determine CpG methylation levels. Statistical analysis determines monoallelic vs biallelic methylation expression across numerous genes linked to the onset or progression of cancers.

Additionally, our lab is continuing to develop an electrochemical DNA (E-DNA) biosensor to detect nontuberculous mycobacteria (NTM). As glycopeptidolipids (GPLs) are found on the exterior cell wall and are exclusive to most NTM, GPL is used as the molecular target for the E-DNA biosensor. We are currently performing SELEX (systematic evolution of ligands by exponential enrichment) to discover a GPL-specific DNA aptamer. Ideally, this aptamer based sensor will provide a point-of-care alternative to the invasive and time-consuming diagnostics currently available for NTM.

Finding Fixed Characters for $Sp(6, q)$

Pryor, Frank – Corresponding Author
Student Co-Author(s): Andrew Peña
Faculty Mentor: Schaeffer Fry, Mandi
Major/Research Area: Mathematics (MTH)
Additional Tags: Funded by NSF Grant DMS-1801156

Oral Session 1 (9:30-10:30am), Room 2

In algebra, a group is a collection of elements that are related through a binary operation (multiplication or addition, for example), and satisfy certain conditions. The study of groups also gives us a way of describing the structure of symmetries of equilateral polygons (in this case, the binary operation would be rotations and reflections of the polygon). We can represent each of these group elements as an invertible matrix, and the trace of this matrix representation is known as a character. Not only does the character of a representation give us important information about the group element itself, but we can also take multiple representations to create a character table. From this character table we can glean information regarding properties of the group as a whole, along with its subgroups. In our particular project, we look at a finite “symplectic” group known as $Sp_6(q)$, and aim to prove a conjecture that proposes a correlation between the makeup of its characters and the properties of its subgroups.

Group Work in the Classroom: Experiences of Neurodiverse Students

Rhoades, Anita – Corresponding Author
Faculty Mentor: Santhanam, Siva priya
Major/Research Area: Speech, Language & Hearing Sciences (SLHS)
Additional Tags: Community-Based Project

Poster Session 3 (2:15-3:15pm), Poster #4

Group work in college typically elicits a range of responses from college students. Many students dislike groupwork due to social communication challenges, conflict with group mates, coordination challenges, or not receiving clear directions on the assignment. However, most students also see the benefits of group work and understand the importance of transferring the skills to working in a group into their career post-college. In this study, we were interested in understanding what college students perceived as challenges in group work. We were specifically interested in learning about the experiences of neurodiverse students who participate in group assignments in college classrooms. Ten students on the autism spectrum, ten students with a diagnosis of a learning disability or attention deficit hyperactivity disorder, and ten students with no known diagnosis participated in the study. All students were from Metropolitan State University of Denver and represented a variety of majors. They completed

online surveys and an interview describing their experiences in group work. We are currently analyzing the data. Preliminary results of this study along with recommendations for university professors and college students will be discussed in our presentation.

Land or Ocean sourced plastic waste – which would you prefer for your next meal?

Riley, Tim – Corresponding Author

Faculty Mentor: Schliemann, Sarah

Additional Mentors: Megan Hughes

Major/Research Area: Theatre (THE)/Environmental Science (ENV)

Additional Tags: Part of Honors Thesis

Oral Session 1 (9:30-10:30am), Room 1

Plastic production has increased significantly over the years as our reliance on this product has increased. In 1950 the world produced only 2 million tons per year while by 2015 the annual production had reached 381 million tons. There are substantial and increasing quantities of plastic pollution in the marine environment. It is estimated that more than eight million metric tons of plastic is entering our ocean every year. The durable nature of plastic means that this material will not biodegrade in the ocean and will simply break up into smaller and smaller pieces, lingering in the marine environment for centuries. These plastics pose an obvious danger to sea life through entanglement in and consumption of plastic debris, both of which are often fatal. The purpose of this paper is to assess the growing threat of plastic pollution in the ocean through examination of existing research and to consider the potential that microplastics in the ocean environment may potentially lead to adverse human health risks.

Microplastics present a hidden, different and more insidious threat that could prove to be far more widespread and damaging to the healthy functioning of marine life especially since their size range mimics the prey size ingested by marine organisms. Microplastics also attract and absorb toxic contaminants (such as DDT) making them even more potentially hazardous to a marine organism that eats them, including those higher on the food chain. The consumption of microplastic by humans has the potential to occur through the ingestion during this food chain and can potentially lead to adverse human health effects. The gaps identified in current research indicate that there should be continued and more in depth research in the area of potential human health risks.

Key words: plastic pollution, microplastics, marine life, human health risks

AI Chess Arm

Ritchie, Kayla – Corresponding Author
Faculty Mentor: Beaty, Steve
Major/Research Area: Computer Science (CS)
Additional Tags: Undergraduate Research Mini-Grant Recipient

Oral Session 3 (2:30-3:30pm), Room 1

The project is creating a custom chess board that eventually can play a game of chess against a human. The light up board is powered with a mechanical arm using a Raspberry Pi, and has software being developed to teach the arm to move chess pieces correctly. It is a work in progress and I hope to have the arm correctly moving pieces in the near future. Currently the board itself lights up, the arm flickers and waves, and a simulation of Artificial Intelligence playing chess has been created. The simulation is able to move pieces, win/lose, and some advanced chess moves such as castling and en passant. The board is made of wood with a resin epoxy poured homemade chess board.

Yoga Psychotherapy

Robertson, Jennifer – Corresponding Author
Student Co-Author(s): Zahava Heydel
Faculty Mentor: Rhoads, Michael
Major/Research Area: Psychology (PSY)
Additional Tags: Undergraduate Research Mini-Grant Recipient

Poster Session 4 (3:30-4:30pm), Poster #8

There is a countless number studies on the effect of yoga therapy for certain psychological disorders. This project goes into depth on yoga therapy for psychological disorders. Yoga uses mindfulness, breathing (pranayama), and postures (asanas) in order to help individuals lower their stress, depression, and anxiety. Our focus in this project steers into the trauma realm and how yoga therapy affects individuals with PTSD and what ways it could help their symptoms with the PTSD. We would like to conduct our own research with therapists who will conduct yoga therapy on patients with trauma. We would like to have participants involved that had to be pushed farther because of the COVID pandemic. Participants would be female adults who have gone through some type of trauma. We would like the participants to take part in about 15-20 sessions, and we have been doing research on other yoga studies that have been done on other individuals who have PTSD and trauma related psychological distress and how significant the effect was on these participants. We would like to learn more about what kind of yoga is implemented and if certain yogas work better than others on trauma participants. The project has been a lot more geared toward research on yoga studies so far, rather than conducting our own study, because of the restrictions that COVID has implemented at the beginning of the study. Even with the restrictions from COVID we were able to get an immense amount of research done on how effective yoga therapy seems to be for individuals with different types of psychological disorders, with a focus geared towards trauma.

Phonetic analysis of semantics

Secor, Benjamin – Corresponding Author
Student Co-Author(s): John Barrington
Faculty Mentor: Goodnick, Liz
Major/Research Area: Philosophy (PHI)

Pre-recorded Oral Session 4 (4:00)

The boundary between syntax and semantics is a prominent issue in both linguistics and the philosophy of language. It seems apparent that words themselves have meaning (semantics), but the sounds of words are meaningless segments used to form the words (syntax). I will argue that the sounds of words contribute to the meaning, and are not merely a syntactical utility. To accomplish this task, this paper will compare the philosophies of Friedrich Nietzsche and Arthur Schopenhauer. The thinkers diverge in the areas of metaphysical beliefs and the extent of nihilism present in their works. Additionally, Nietzsche adhered to a will to power while Schopenhauer adhered to a will to live. These two thinkers' divergent philosophies and ideologies are reflected directly in the phonetic nature of their works. A computer program tabulated phonetic sounds within prominent essays of both Nietzsche and Schopenhauer. The results from the computer analysis showed that the differences in the philosophies of Nietzsche and Schopenhauer are directly reflected in the phonetics of the actual essays analyzed. This suggests that phonetics contribute to the semantics of the essays and not just the syntactical construction of words themselves. The correlation established between phonetics, and the philosophical divergence between Nietzsche and Schopenhauer, suggests that the meaning of words is not held simply in the word as whole, but rather includes the phonetic structures of the word (despite these phonetic sounds not being as phenomenologically available to the speaker as the word). Further research will attempt to find philosophical themes that correlate with phonetic structures of given essays.

Perceived Stress During a Pandemic: Our Pets' Positive Effect

Slaski, Morgan – Corresponding Author
Student Co-Author(s): Cassie Gibbs, Phillip DeDionisio, Elizabeth Malagisi, Sierra Held, Nayeli Cisneros, Luke Tilsley
Faculty Mentor: Erickson, Cynthia
Major/Research Area: Psychology (PSY)

Poster Session 4 (3:30-4:30pm), Poster #7

Human's perception of stress plays an important role in both their physical and mental health. As a result of mandatory lockdowns and social distancing, people are spending more time than ever before at home. For college students in particular, these mandates have led to increased anxiety, depression, and loneliness compared to before the crisis. This lack of social interaction has led many individuals to turn to their animal companions as a source of comfort and support in uncertain times. Although the variable circumstances of COVID-19 have led researchers to study the role pets play in helping humans manage the unpredictability of a pandemic, it is not the first time that the effect of the pet/owner relationship has been considered. A 2018 study of Chinese pet owners found that more time spent caring for an animal companion increased attachment levels, which led to lower rates of perceived stress. Pet ownership has also previously been linked to increased levels of oxytocin, which has been shown to lead to decreased levels of psychological stress. These findings both suggest that pet ownership can

assist in managing the reduction of perceived stress in owners. In line with these previous findings, we predicted that pet ownership would have a negative correlation with the perceived stress of owners during the COVID-19 pandemic. The current study used the Perceived Stress Questionnaire which covers a 30-item list of 4-point scaled questions designed to measure stress in patients with chronic pain. Out of 469 introductory psychology students, the data of 390 respondents was used after attention checks. Additionally, any participants that opted not to answer the pet ownership questions were removed, resulting in a total of 376 responses.

An independent samples t-test was conducted, and results showed a significant difference between those who owned pets ($M = .499$, $SD = 0.190$) compared to those who did not own pets ($M = 0.550$, $SD = 0.201$), $t(374) = -2.26$, $p = .024$. Implications for these findings reveal the notable impact pets have on individuals' perception of their stress levels, specifically college students. The positive impact animal companions have on pet owning students' discernment of stress illustrates the importance of providing alternative, remedial outlets for students without access to a pet at home. This recommendation is supplemented by the responses of the non-pet-owning students; the data proposes lack of animal companion interaction positively correlates with increased perceived stress levels. This amplifies support for the suggested need for an outlet or channel to supplement the lack of social support and face-to-face interactions during the pandemic. Additional factors related to perceived stress and pet ownership will be discussed. The confirmatory data collected is from a completed, empirical study.

Rapid and Affordable Detection of Carrion's Disease

Smith, Andrew – Corresponding Author

Faculty Mentor: Bonham, Andrew

Major/Research Area: Biology (BIO)/Biochemistry (BCHM)

Additional Tags: Undergraduate Research Mini-Grant Recipient

Oral Session 2 (10:45-11:45am), Room 1

Carrion's disease is an infectious hematologic disease caused by *Bartonella bacilliformis* affecting mainly rural, impoverished populations in northern Peru, Ecuador, and Colombia. Left untreated, the disease's mortality rate is between 40 and 80%. Diagnosis is difficult because the initial symptoms are similar to other infectious diseases, such as Dengue, but common diagnostic methods have low sensitivity. In the acute phase, thin blood smears, the most commonly used diagnostic technique, only have a sensitivity between 24 and 36%. Other diagnostic methods, such as PCR, are not viable due to the remote and resource-poor nature of the areas of endemicity. As such, there is great need for better diagnostic methods. eDNA biosensors are an appropriate solution to this problem as they are cheaper than most modern diagnostic methods, are highly portable which allows them to be used in rural communities, and can have detection limits in sub-nanomolar concentrations. Our development technique centers around the use of SELEX (Selective evolution of ligands by exponential enrichment), in which DNA fragments are assayed for their ability to bind our target, an extracellular matrix protein of *B. bacilliformis*. Those that bind well are replicated by error prone PCR and re-assayed until a DNA oligonucleotide is developed that binds well to the target. Once an aptamer has been created that binds well to the target, it will be sequenced and then modified into an aptamer with on and off conformations, which allows this sequence to act as a biosensor. Currently, our target has been purified and we are awaiting the results of the SELEX process.

The East-Pacific War and Modern Relations in the Far East

Steinmeyer, William – Corresponding Author
Faculty Mentor: Maestresjuan, Andrea
Major/Research Area: History (HIS)

Oral Session 2 (10:45-11:45am), Room 2

My project focuses on the lingering cultural memory around the issue of Japan's wartime crimes against its Asian neighbors, especially Korea. To this day, Japan denies the atrocities they committed during the first war, many of the atrocities committed while they held Korea as a colony after the Treaty of Versailles, and effectively refuse to admit any wrongdoing during this era. For this reason, the Korean and Chinese populations still demonstrate an overwhelming dislike, bordering on a racist disdain, against the Japanese nation. Many people incorrectly assume that the origin of this tension lies in World War II and events such as the rape of Nanking, and fail to realize the deep tensions go back much further than that. My project utilizes first-hand accounts, such as those of Korean women forced to be "wianbu" which roughly translates to "comfort women" for Japanese soldiers during the Great War and during the occupation following 1918, with Japanese perspectives on the war and their relationship with the other world powers to demonstrate that Japan was not alone in their atrocities. I then analyze the events of this period and illustrate how they influence modern relations, drawing on contemporary renditions of the war such as the smash-hit Korean drama Gaksital which translates to Bridal Mask, and its depictions of the Japanese, and how it conflicts with Japanese depictions of the same events. Using these modern portrayals together with the historical record, I attempt to express how deeply this issue still affects modern relations between these economic powerhouses. I am most concerned not with what factually happened but how it is remembered, and thus still influences modern geopolitical and social relations in a part of the world most people Westerners overlook.

Laos: Music, War & Diaspora

Taylor, Emma – Corresponding Author
Faculty Mentor: Macy, Elizabeth
Major/Research Area: Psychology (PSY)/Music (MUS)

Oral Session 1 (9:30-10:30am), Room 3

To most, Laos is a country unknown. To some, it stands as an untouched gem tucked into a corner of South East Asia- however there is much more to Lao culture than meets the eye. Surrounded by Myanmar, China, Vietnam, Cambodia, and Thailand, Laos is a landlocked country with a long and violent history. Colonization by the French and isolation from the rest of the world has greatly impacted global understandings of it as a place and of the people that call it home. Accordingly, it is impossible to analyze Laotian music or culture outside the proper historical contexts that have so drastically and permanently shaped it and its people. As a result of the violence and trauma of the Vietnam war, many Laotians fled as refugees and relocated elsewhere around the world, forming a Laotian diaspora. Members of the Laotian diaspora (a movement or migration of people, culture, ideas, and beliefs) use music as a means of staying connected to their culture, and combating feelings of "placelessness." Despite the countless adversities Laotians face (and the powerful influence of neighboring countries), the Laotian musical tradition has survived and found new ways to preserve its unique sounds and characteristics for future generations. Both the music and people of Laos have been impacted by historical violence that has shaped them today. This analysis uses methodological research in order to examine the unique characteristics of Laotian music, the historical and cultural contexts for musical development both in Laos and in the diaspora, as well as the evolution of these characteristics through time. In doing so, it analyzes the impacts of the many wars on the music

and its listeners, as well as highlights the post-war music scene and its many developmental influences on the Lao people.

The Bioerosion of Sea Urchins

Thomas, Bethany – Corresponding Author
Faculty Mentor: Cooley, Christopher
Major/Research Area: Biology (BIO)

Poster Session 4 (3:30-4:30pm), Poster #4

Coral reefs are essential ecosystems that help create biodiversity in the oceans and protection for the surrounding coasts. Protecting coral reefs has become such an important task for scientists around the world, especially with the increasing sea urchin populations. The presence of sea urchins is important if they remain at a reasonable level. There are many studies on coral reefs and the importance of preserving them, but there are still problems when it comes to bioerosion due to over grazing.

Human intervention is not always the best option for preservation, but sometimes ecosystems are in danger of degradation because of initial human intervention, such as overfishing. When the predators of sea urchins are being fished so aggressively, there are not enough present to keep the sea urchin population under control. The methods I will be using in this research project include observing tide pools in Hawaii and collecting photos of the sea urchins occupying these tide pools.

In order to protect coral reefs from bioerosion, the sea urchin populations need to be under control. Protecting the predators of sea urchins is something that can have a huge beneficial impact on coral reefs, that way the sea urchin populations are no longer out of control.

The Impacts of Human Intrusion on The Population Levels of Mosquitos (family Culicidae)

Tweedy, Samuel – Corresponding Author
Faculty Mentor: Cooley, Christopher
Major/Research Area: Biology (BIO)

Poster Session 2 (11:00am-12:00pm), Poster #5

The focus of this study is human intrusion on ecosystems and the effects it has on mosquito populations. Mosquitoes, organisms belonging to the family Culicidae, are the subject of this study because it has been suggested in some scientific circles that while most organisms experience negative effects from human intrusion, mosquitoes actually benefit from it. The hypothesis of this study aligned with these suggestions and stated that human intrusion benefits mosquito population levels and their chances for survival in several direct and indirect ways. To confirm this claim, multiple forms of human intrusion were explored. To begin, direct human/mosquito interactions and their effects on mosquito populations were explored. First, the human-facilitated introduction of mosquitofish, a popular mosquito predator, into ecosystems containing mosquitoes was covered as well as its unintended beneficial effects on mosquito populations. These effects consisted of the decrease of native mosquito

predator populations and the increase in mosquito-supporting algal blooms due to overzealous predation from the mosquitofish. Next, the unintended mosquito-favoring effects of pesticides used on ecosystems containing mosquitoes was explored. These effects consisted of collateral damage to mosquito predators as well as the risk of increased pesticide-tolerance in mosquitoes. Next, the focus shifted to exploring how human actions indirectly affect mosquito populations. First, the increase and enhancement of mosquito breeding grounds and reproductive cycles due to human-facilitated deforestation was explored. Finally, the mosquito predator reduction and decreased competition for food resources within mosquito populations due to inorganic nitrogen enrichment in ecosystems containing mosquitoes was explored. In conclusion, the results confirmed the hypothesis; although human intrusion may directly decrease mosquito populations in several ways, it also happens to benefit mosquito population levels in more direct and indirect ways overall.

Synergizing two Approaches to Service Delivery for Children on the Autism Spectrum

Valenzuela , Jaquelin – Corresponding Author

Student Co-Author(s): Nathaniel Roybal

Faculty Mentor: Santhanam, Siva priya

Major/Research Area: Speech, Language & Hearing Sciences (SLHS)

Additional Tags: Undergraduate Research Mini-Grant Recipient; Community-Based Project

Poster Session 3 (2:15-3:15pm), Poster #3

Intervention for children on the autism spectrum typically focuses on increasing social engagement and communication. Additionally, some children on the autism spectrum may demonstrate behaviors that may be harmful to themselves or to their communication partners. Speech-language pathologists (SLPs) and behavior analysts (BAs) are important service providers for children on the autism spectrum and their families. Although the goals of service provision are similar, the two professions differ greatly in the theoretical foundations and approaches to assessment and intervention of communication, behaviors, and social interaction. Therefore, collaboration between SLPs and BAs are challenging in both public schools and private clinical settings. The main purpose of our study is to understand the potential for collaboration between the two professions. We are currently collecting data with SLPs and BAs on their experiences in working with children on the autism spectrum, their understanding of autism, and their perspectives regarding inter-professional collaboration. We have completed collecting data with one participant through a survey and an interview. We will be presenting findings from our analyses as part of this presentation.

Sex Ratio and Pair Bond Formation in Convict Cichlids

Van Lieu, Rory – Corresponding Author
Student Co-Author(s): Isiah Newbins
Faculty Mentor: Gagliardi Seeley, Jennifer
Major/Research Area: Biology (BIO)

Poster Session 3 (2:15-3:15pm), Poster #1

Operational sex ratio has been shown to affect the formation of pair bonds in the monogamous Midas Cichlid (Rogers 1987). Here we are going to test how sex ratio affects the socially monogamous convict cichlid (*Amatitlania nigrofasciata*). Convict cichlids are biparental. Previous research has suggested that both females and male are choosy during pair bond formation (Beeching and Hopp 1999); thus, suggesting that they need multiple individuals to make a choice. If sex ratio affects pair bond formation, we predict that the control with 1 male: 1 female would have fewer pair bond formations and average day would take longer to form a pair bond than the experimental treatment groups. Furthermore, the group with 2 females and 2 males will have most and quickest pair bond formations, since this group allows for both the male and females to make a choice. This experiment contains one control (one male and one female), and three experimental treatment groups with different sex ratios: 1) One male and two females; 2) One female and two males; 3) Two males and two females. In addition to the focal fish, juveniles will be placed behind a clear divider to be used as an intruder, but not as a potential mate to increase pair bond formation. Five observations per day will be done using a webcam stream to determine when a pair has formed. After a pair bond has formed and other focal fish have been removed, videotaping of the pair's behaviors will be recorded for fifteen minutes. The videos will then be analyzed using Ethovision for courtship and aggression behaviors. This experiment has just begun, and preliminary data will soon follow.

Development and application of a nested multiplex quantitative PCR assay to confirm CTCF-binding at specific locations in the varicella-zoster virus genome

Whatley, Katrina – Corresponding Author
Faculty Mentor: Ferrell, Rebecca
Additional Mentors: Randall Cohrs
Major/Research Area: Biology (BIO)

Additional Tags: Internship, University of Colorado Anschutz Medical Campus

Oral Session 1 (9:30-10:30am), Room 1

Varicella-zoster virus (VZV) belongs to the alphaherpesvirus family, a family of viruses with the characteristic ability to establish a stable latent relationship with host cells. VZV is responsible for chicken pox at first exposure and shingles upon reactivation. The specific aim of this research was to design a SYBR-based nested multiplex qPCR assay using chimeric primers to quantify CTCF occupancy at multiple locations on the viral genome associated with latency maintenance. During latency, VZV transcribes a set of genes from a single locus that are collectively named Varicella Latent Transcripts. Working under the hypothesis that the latent VZV genome and host genome are under similar transcriptional control, we predicted CTCF-binding onto the latent virus DNA regulates latency. Previously, we had identified three candidate regions of CTCF-binding on the VZV genome by chromatin immunoprecipitation and next-generation sequencing (ChIP-seq). The goal of this project was to develop a quantitative PCR assay to validate these candidate CTCF-binding sites on VZV DNA present in latently infected human trigeminal ganglia (TG). Preparation of the assay included identifying primer sites within both known CTCF-binding sites and at control

sites, constructing standard curves for each primer set (primary and nested) to determine assay sensitivity, specificity, and dynamic range of detection, along with calculate corrective efficiency, and engineer a spike-in positive control to mimic ChIP-seq results. The assay was applied to extremely small amounts of DNA generated from human TG removed at autopsy. Creating a ratio comparing input TG DNA to immunoprecipitated DNA at each site normalized to the control site indicated CTCF occupancy. Analysis of these results from TG samples is ongoing.

***Sabethes chloropterus* Mechanoreception Research**

Zakrzewski, Kenneth – Corresponding Author

Student Co-Author(s): Phillip DeDionisio

Faculty Mentor: Hancock, Robert

Major/Research Area: Biology (BIO)

Oral Session 1 (9:30-10:30am), Room 1

Mosquitos are disease vectors and their behavior are of significant importance. Mosquitoes lay their eggs in water, and the subsequent larvae that hatch are filter feeders. Some larvae are also known to be predatory and prey upon other species of mosquito larvae. This behavior is interesting to learn as it can be manipulated to control the mosquitoes and has possible significance in controlling other mosquito populations. One such species is *Sabethes chloropterus*. These mosquitoes lay their eggs inside of cavities within vegetation, typically downed trees. Recent research has shown that *S. chloropterus* larvae become predatory and cannibalize once they reach a certain size and maturity. As speciation does not play a part in their selection of prey, chemical reception is not considered to be a factor in sensing prey. The amount of light available to these larvae in their natural environment is minimal as well and as such photo taxis is also ruled out as a potential means of sensing prey. We propose that *S. chloropterus* larvae use mechanoreception to detect and select larval prey.

*STUDENT IMPACT &
INNOVATION SHOWCASE*



PROJECTS

West Metro Fire Rescue

Corresponding Author: Adams, Raina

Major/Research Area: Human Performance & Sports (HPS)

Additional Tags: Earn and Learn

Oral Session 2 (10:45-11:45) Room 6

An oral presentation depicting my experiences and knowledge gained while interning at West Metro Fire.

Boulder Probation DPO Unit

Corresponding Author: Armendariz, Jacquelin

Major/Research Area: Criminal Justice & Criminology (CJC)

Additional Tags: Earn and Learn

Oral Session 2 (10:45-11:45) Room 6

Addiction Studies

Corresponding Author: Barela, Felicia

Mentor: Angela Furney

Major/Research Area: Human Services (HSP)

Additional Tags: Earn and Learn

Oral Session 1 (9:30-10:30) Room 6

I am Felicia Barela, a senior majoring in Human Services with a concentration of Addiction Studies. I am currently interning at a facility called DOVE Counseling Inc. The main population we work with are department of correction (DOC) clients. In addition, we provide counseling and treatment to domestic violence offenders for men and women. The cases for these clients vary, meaning some cases are physical and some are intentions of scaring the other party as if the offender were going to physically harm them. We also offer treatment for offenders arrested while driving under the influence of drugs, alcohol, or both. We refer to the clients as DUI offenders. DOVE provides treatment for 4+ offender groups. The 4+ treatment is focused on clients who have been charged with at least four DUI's. These clients struggle with a lot of denial around their substance abuse and many distortions throughout their life. One of the main counseling groups that we offer is called Relapse Prevention group. These groups also focus on denial patterns and cognitive distortions on a smaller scale. We also help clients identify their triggers around substance abuse and provide coping skills for times when clients are triggered. These clients also practice communication skills and building boundaries in their workplace, at home, with family, and with their partners.

What we can do: Build strong boundaries. Speak on when boundaries are crossed. Have conversations around our boundaries. Have expectations of the clientele we work with. Express and communicate these goals and expectations so no one feels they are left behind. As easy as enabling a client is, it is more harmful than beneficial. Help clients believe in their worth as a human and help clients identify their strengths as well as their weaknesses.

International Hemp Internship Experience

Corresponding Author: Bohling, Tori

Major/Research Area: Communication Design (CDES)

Additional Tags: Earn and Learn

Session 4 (3:30-4:30) Poster 9

My poster will highlight my internship experience with International Hemp. International Hemp is a leader in certified hemp genetics and the selling of hemp seeds. Much of the focus in the industry has been on cannabinoid's but International Hemp has been working with American farmers to change the conversation of the industry and shift it more towards the benefits of fiber and grain in the hemp industry. The hemp industry is a relatively new industry – an industry that very little education is provided on, and very few know about. Hemp is a great resource for both farmers and consumers. If the world truly focuses on building up a successful hemp industry, we could contribute to a more sustainable future. My internship with International Hemp is focused on bringing together my abilities in marketing and graphic design. Working with International Hemp, I have gained such a vast knowledge of the industrial Hemp Industry that I had no prior knowledge on. A few of my projects have included the following; developing brand standards for all marketing and collateral, learning CRM platforms like HubSpot, creating advertising campaigns and working alongside the marketing coordinator to analyze previous marketing trends to determine what our customers are interacting with the most, and finally, assisting in the first public expo International Hemp has attended since their rebranding in early 2020. For my poster presentation, I would like to address my involvement with the company International Hemp, as well as bring in some education that I have learned throughout my experience, so that others can get a better understanding of the hemp industry.

Interiors by Jacquin

Corresponding Author: Cafaro, Kat

Mentor: Kelly Monico

Major/Research Area: Communication Design (CDES)

Additional Tags: Earn and Learn

Session 2 (11:00-12:00) Poster 7

I will compose a poster based off my internship at Interiors by Jacquin. I will be explaining her business, what I have done, and how this has helped my studies. Her company is based in

Dallas, Texas. Even though her business is Interiors by Jacquin, she is also about to start a new speaker and educator business that I am also designing for. So far this has been an excellent learning experience.

Interning for the Colorado State Public Defender Brighton Regional Office

Corresponding Author: Camacho, Samantha

Major/Research Area: Social Work (SWK)

Additional Tags: Earn and Learn

Oral Session 2 (10:45-11:45) Room 6

I am a social work intern at the Colorado State Public Defender Brighton Regional Office. The Colorado State Public Defender provides legal counsel to everyone who is being charged with a crime and cannot afford private counsel. They also provide social work services to a portion of their clients. The social work services provided include support in finding mental health treatment, substance use treatment, and housing as well as writing mitigation reports and putting together mitigation presentations to present to judges and DA's. The social worker works closely with clients and clients' family members to put together mitigation reports and work closely with public defenders to make sure everything is being done to reach the client's goals. Currently I am assigned to a couple of cases. I work with both of my supervisors, one a social worker and the other a public defender, to complete assignments. I have an array of responsibilities that differ from case to case. I interview clients and clients' family members, go through any type of records available, put together mitigation reports, and help clients get connected to needed resources. This internship has allowed me to put all of the skills and theories I have learned in my classes for the past 2 years in the social work program, into practice. It gives everything I am learning in class more meaning when I can apply it to the people I am working with and can discuss what I am learning in terms of how that affects my internship with my supervisors. I have always been interested in working in or around the criminal justice system and this internship has allowed me to learn more about how the criminal justice system is and has opened my eyes to just how much out there needs to be changed and how passionate I am about this type of work. Being able to be a part of a program which pays you for an unpaid internship, Earn & Learn, how really allowed me to focus more on my internship without having to worry about finances. There is so much you can learn from doing work in the real world instead of attempting to just learn from a textbook and being paid for your time is something that is incredibly helpful in not limiting your options in what internships you can pursue.

Covid Vaccine Outreach for Immigrant and Undocumented Community

Corresponding Author: Chacon-Acevedo, Gemma

Mentor: Randy Smith

Major/Research Area: Psychology (PSY)

Oral Session 1 (9:30-10:30) Room 6

Covid-19 has had a global effect, and there is no individual who hasn't been affected by it. Unfortunately, the least represented and most vulnerable communities have been heavily impacted by the effects of this pandemic. Fortunately, the process of producing a vaccine has moved quickly and it has begun to be distributed nationally. The less represented populations have encountered additional challenges in obtain the vaccine, information, or are skeptical about it. The BCHART Aurora project initially focused on providing support to the black community, but they have extended their services to other underrepresented communities, such as undocumented immigrants, and refugees. The purpose of this project is to remove challenges for these communities and provide easier to access to people who want to receive the vaccine. BCHART Aurora is working closely with local clinics to make the vaccines available for the black, undocumented and refuge population. The opportunity to educate communities about vaccines is another challenge that healthcare has encountered and BCHART plans on being able to provide educational resources to the community. It has been a focus for BCHART to provide these resources through other members of the community as well as provide information in their preferred language. With skepticism about receiving the vaccine, having a trustful system in place that supports, educates, and provides resources to the communities, and other health related resources, has been a main focus for BCHART. This project is slowly becoming live due to the logistics that need to be in place before rolling it out, however, there has been already a number of participants who have been able to benefit from this program.

Integrative Special Care Clinic for Children with Special Health Care Needs

Corresponding Author: Cisneros Saucedo, Nayeli

Mentor: Verenea Serrano

Major/Research Area: Psychology (PSY)

Additional Tags: Earn and Learn

Oral Session 2 (10:45-11:45) Room 6

The Children's Hospital Colorado has a multidisciplinary primary care clinic for children with special health care needs called the Special Care Clinic. The Special Care Clinic works with children with diagnosis such as, down syndrome, congenital heart disease, seizures, prematurity, genetic disorders, and other chronic medical problems. The team of professionals includes pediatricians, psychologists, a social worker, dietitians, nurse care coordinators, community health navigators, and pharmacists. They work together in order to bring quality physical, mental, and behavioral health care to patients. Research highlights the significant stressors these caregivers face and suggests improving existing programs to better fit family's and patient's needs. This presentation will discuss the literature on behavioral health services

for children with special health care needs, why this population encounters barriers in accessing quality care, and caregiver's experiences with parenting a child with special health care needs. During my internship in the Special Care Clinic, I have worked with the principal investigator to execute a study that will examine characteristics of integrated behavioral health services and family experiences with these services. In this study qualitative interviews are being conducted, families are interviewed via zoom or telephone and receive an incentive for participating. The interviewer asks questions about parenting, the family's support system, their experience with integrated behavioral health, and the supports they would like for child and family well-being. Additionally, participants are asked what aspects of the behavioral health services were helpful to them and their children and what aspects could possibly change and improve. The study is ongoing and preliminary results will be shared during the presentation.

Impact of Mental Health and Addiction during the COVID-19 Pandemic

Corresponding Author: Claussen, Cali

Mentor: Tara Hammar

Major/Research Area: Human Services (HSP)

Additional Tags: Earn and Learn

Oral Session 1 (9:30-10:30) Room 6

The purpose of this work is to educate the audience on the severity of substance abuse in their own communities and the effect this has on healthcare professionals and agencies. This is important because these problems are life and death for my clients. My clients are aiming for recovery but planning for relapse and some clients know that they are not going to make it through another relapse alive.

I am addressing the relation between substance use and mental health. I am explaining the influx of clients my agency has received and the effects on the human services industry as the pandemic shifted the perspective of human service industry.

I will be demonstrating the severity of the problem using statistics from reputable sources monitoring the COVID-19 outbreak, addiction client population, and the impact on surrounding Denver communities.

I am connecting my internship to the accessibility of care, the power insurance has on dictating client approvals for treatment, and different types of resources that clients may use to get help in our community. I have also worked in my Behavioral Health Professional Preparation Program (BHPPP) to put together a multidisciplinary resource list to help our clients and healthcare providers updated access to ensure the best care of the clients suffering in this pandemic.

Exploring the Causes, Mechanisms, and Effect of Arthropod Bioacoustics

Corresponding Author: Colling, Haley

Mentor: Nathan Behl

Major/Research Area: Biology (BIO)

Oral Session 2 (10:45-11:45) Room 4

The stimuli and mechanisms for arthropod sound production can provide valuable knowledge for their care and maintenance. The Westminster Butterfly Pavilion houses diverse sound-producing arthropods including European House Crickets (*Acheta domesticus*), Goliath Birdeater Tarantula (*Theraphosa blondi*), Madagascar and Halloween Hissing Cockroaches (*Gromphadorhina portentosa*, *Elliptorhina javanica*), African Fruit Chafer Beetles (*Pachnoda sinuate*), Jade-Headed Buffalo Beetles (*Eudicella smithi*), and Jungle Nymphs (*Heteropteryx dilatata*). Studying these arthropods provides an opportunity to better understand aspects of arthropod sound production that can be used to improve their care such as which species produce sound, the benefits of sound production, and how and why sounds are produced. I hypothesize that the exposure to handling will elicit auditory responses more often than other stimuli, that adults will respond to stimuli more than juveniles, that most sounds will be produced through stridulation, and that males will produce sounds used to attract mates more than females. I will test these hypotheses by exposing arthropods to 3 different stimuli including, potential mates, observed threats, and physical handling and recording any sounds produced in response. I expect that auditory responses are less commonly used in defense, and therefore will not be produced in response to threats. Additionally, I expect that sounds are most often produced utilizing stridulation. I also expect that adults make more sound than juveniles. Lastly, I expect sexually mature males to produce sound more than females, particularly in response to potential mates.

Parolee Initiative for Education

Corresponding Author: Collins, Ashley

Mentor: Jason Lopez

Major/Research Area: Integrative Health Care (IHC)

Additional Tags: Earn and Learn, Community-Based Project

Session 4 (3:30-4:30) Poster 10

This semester I took on the development of a nonprofit organization called Parolee Initiative for Education (PIE). The presentation will focus on some of the statistics surrounding incarcerated individuals, their general education levels, how this impacts recidivism, and how PIE helps to lessen the rates of recidivism among this population. The PIE approach involves creating a personalized plan to help the justice-involved individual meet their goals in regards to education, be it collegiate, financial education, skills training, certification, self-awareness, or others. We also work to help them overcome their specific limitations be they perceived or physical in nature. We also offer workshops, help build supportive community, and educate the public to help dispel some of the myths and stigma which exist around incarceration.

It is our hope that by helping to increase education levels in the formerly incarcerated community and by reducing some of the fear and misunderstanding that surrounds them, that these people can truly build a life that is worth living. Education brings with it independence, increased earning power, self-awareness, and the hope of a promising future. No one should be denied these things based solely on past criminal activity.

Project C.U.R.E.- Delivering Health to the World During a Pandemic

Corresponding Author: De La Garza, Erica

Major/Research Area: Integrative Health Care (IHC)

Additional Tags: Earn and Learn

Oral Session 1 (9:30-10:30) Room 6

This semester I have been an Operations and Leadership intern at Project C.U.R.E. Project C.U.R.E. is a non-profit that collects donated medical supplies and equipment. Everything that gets donated is then shipped out to clinics abroad in-need. In order to maintain only a 2% overhead, Project C.U.R.E. relies almost entirely on the work of volunteers. When COVID-19 caused an international lock down, volunteers coming to the warehouse to assist in getting shipments ready were scarce. But, the pandemic only increased the demand for medical supplies and equipment. As an operations and leadership intern, I had a few essential functions: get volunteers to come serve at the warehouse and encourage these volunteers to come back. In order to be an effective team leader for these volunteers I had to tap into the teamwork and teaching skills I was taught in the IHC program. I have been able to adapt to the different needs of each volunteer I led. Some volunteers were young and rambunctious while others were retired and were slower to understanding new directions. The IHC program taught me how to evaluate, recognize, and listen to others' needs. It is only then that I could adjust duties to make each person an effective volunteer. The work the volunteers do is crucial to the health and wellbeing of thousands of patients internationally. Being a non-profit, Project C.U.R.E. gives almost everything to these struggling communities. That also meant I would not get paid for the internship. The Earn and Learn program allowed me to fully invest my time and energy into Project C.U.R.E. without having to worry about finances. MSU Denver, the IHC Program, Earn and Learn, and Project C.U.R.E. all helped to deliver health to the world during a pandemic!

Girls Incorporated of Metro Denver

Corresponding Author: De La Rosa, Elizabeth

Mentor: Tara Hammar

Major/Research Area: Human Services (HSP)

Additional Tags: Earn and Learn

Session 4 (3:30-4:30) Poster 11

My internship began in mid-late January of 2021 at Girls Inc. of Metro Denver. This collaborative organization advocates on behalf of girls between the ages of 5-18 by delivering evidence-based programming and experiences. Girls Inc. serving as a pro-girl environment, focuses on the development of the girl, providing guidance, support and mentoring through healthy living, academic enrichment and support, and life skills instruction programs. Currently, my main project is collaboratively working with Product Development for a new program called, "Girls thINC Outside the Box" which is a fun, monthly subscription box containing materials for an activity enrolled girls can do at home. I have been helping developing ideas for upcoming boxes, gathering the materials needed for each box online while tracking important details such as budget, size, quantity, etc. Outside of this project, I also help educators with programming by creating lesson slides and assisting in daily programs with overall, virtual class management.

Girls Inc. has been a helpful, important step for me starting my work with youth, which is my ultimate goal as a Human Services professional. Interacting with the girls I serve and building the relationships I have with them in the last few months makes me want to continue forward in this path serving youth. Also, Girls Inc. has made me realize that I want to explore working in more non-profit organizations in the future. And finally, the technical and communication skills I have gained along with the networking I have worked on with my colleagues here will be of tremendous help for me as I continue into my next placement.

Earn and Learn has provided me with the financial aid that I have been in need of throughout this semester. The last year I have been struggling financially and because my internship hours are 20 hr./week, I am not able to work full-time. Receiving this financial aid has been a true relief as I have been able to stay afloat with my bills as I put in hours at Girls Inc.

Hypnosis Internship

Corresponding Author: DeVoe, Jyona

Mentor: Randy Smith

Major/Research Area: Psychology (PSY)

Additional Tags: Earn and Learn

Oral Session 4 (3:30-4:30) Showcase Pre-recorded Talks

This will be a presentation on the internship I am completing this semester at the Denver Hypnosis Center.

How Earn and Learn Has Positively Influenced Last Semester at MSU

Corresponding Author: Dickinson, Samantha

Mentor: Kathleen Deakin

Major/Research Area: English (ENG)

Additional Tags: Earn and Learn

Oral Session 3 (2:30-3:30) Room 5

Earn and Learn helps students to get paid for an internship that they would otherwise not be paid for. For me specifically, I am currently completing a semester long "internship" as a student teacher. This role is full-time, Monday-Friday. Earn and Learn guarantees 150 hours completed to be paid for to the student. These funds have greatly assisted my family and I. I am a mother to a toddler and have to pay for full-time childcare to carry out my student teaching responsibilities. The work that this agency is doing is so impactful because I would not have had the financial help and assistance to help pay for childcare. I am so grateful that they added student teaching into their approved internships for the program. Most people might not realize how hard it is to carry out student teaching as a full-time experience when you need to pay bills etc. I am so grateful that Earn and Learn exists for students at MSU Denver.

Gender and Personification in Poetry

Corresponding Author: Drago, Jean

Mentor: Richard Sandoval

Major/Research Area: Modern Languages (MDL)

Additional Tags: Honors Program

Oral Session 3 (2:30-3:30) Room 5

Anyone who studies language and ponders gender is sure to consider the significance of the relationship between grammatical gender and perception. Does the largely arbitrary assignment of gender to inanimate objects and concepts influence our perception of those objects and concepts? In the study, "Grammar in art," Segel and Boroditsky (2011) sought to answer this age-old question by measuring the correspondence between the gender of a noun in an artist's native language and the gender of personifications in art. They found a correspondence of grammatical gender and personified gender 78% of the time. I applied a similar process to poetry, asking if the grammatical gender of an object or concept predicts its gender in personification. As a sample, I analyzed odes written by the influential Chilean poet, Pablo Neruda, identifying gender through gendered adjectives and nouns. Preliminary results demonstrate that the grammatical gender of an object is nearly always indicative of the gendered personification. Advancing confirmation one step further, I read translations, and when the grammatical gender changed across translation, the gender of the personification often changed to match the grammatical gender, indicating a significance of grammatical gender in the context of personification in poetry. I have observed a strong correlation between grammatical gender and personified gender, demonstrating perhaps an importance of

grammatical gender in the way that people perceive objects as having an inherent sense of gender based on one's native language. It is important not to jump from correlation to causation, but the correlation is significant, far beyond what one would see if the two variables were independent.

Denver Sports Recovery

Corresponding Author: Duran, Ray

Major/Research Area: Exercise Science (EXS)

Additional Tags: Earn and Learn

Oral Session 2 (10:45-11:45) Room 5

Denver Sports Recovery (DSR) is located about five minutes north of the MSU Denver campus. I chose to do my internship here due to the uniqueness of this company. It is a small but very exciting place to intern. Denver Sports Recovery is divided into two parts, one on one therapies and the recovery center. There are about 17 different therapies offered here including Physical Therapy, Chiropractic, Acupuncture, and various soft tissue therapies. My internship is mainly in the recovery center. As an intern, I give tours of the facility explaining the different therapies and modalities that we offer, I take individuals through soft tissue exercises, and I hook clients up to different modalities. The different modalities that I help with are soft tissue (foam rolling), electrical stimulation, low frequency TENS, hot and cold contrast (hot and cold tubs and cryotherapy), three types of compression sleeves for the arms, legs, and hips. In addition to helping clients on the recovery center, I get to spend time with other therapist such as our Physical Therapist, Chiropractors, and Muscle Activation Therapy. Exercise Science is a middle degree for the above mentioned therapies, in which I am deciding which one I would like to pursue.

Panorama Physical Therapy

Corresponding Author: Espinoza, Reyna

Mentor: Tony Nunez

Major/Research Area: Exercise Science (EXS)

Additional Tags: Earn and Learn

Oral Session 2 (10:45-11:45) Room 5

For the Spring semester of 2021, my internship took place at Panorama Physical Therapy. Panorama serves a variety of patients providing care through uniquely designed and personalized therapy techniques. Each care plan is designed for the different needs of each person ranging from young to old, pre-surgery or post-surgery, acute injury or chronic pain. This internship has been a tremendous opportunity to gain hands on experience in an outpatient physical therapy setting. It has taught me basic skills while working in a healthcare clinic which include being part of a team and being able to communicate in a professional manner with my

supervisors. It has shown me what the everyday life of a physical therapist looks like and what their duties entail. In addition, I have improved my verbal communication skills by interacting with both the therapists and the patients. Being able to help people get better and see improvements has been the most rewarding part of the internship. Seeing patients achieve their goals, big or small, makes the whole experience worthwhile. This internship is also required as a course credit in my major, therefore I am one step closer to achieving my degree and making the decision to pursue this career. Earn and Learn has helped make this possible by helping remove some of the financial stress that comes with balancing an internship, taking additional classes, and working part time. The financial assistance has allowed me to focus on my studies and perform better at my internship.

Breathing Room: How This Program Probably Saved my Academic Career

Corresponding Author: Feldner, Casey

Major/Research Area: Education (EDU)

Additional Tags: Earn and Learn

Oral Session 3 (2:30-3:30) Room 5

The presentation will go over how before I was chosen for the Earn and Learn program. I didn't know how I was going to pay for food, rent, and school. However, because of this program I was given that ever important "breathing room" that allowed me to get started on the path to picking myself up and bettering myself not only personally but also academically too.

After losing my job right before the start of the Fall 2020 semester I was in a dark place. I was working in a restaurant so there was no 'safety net' to help me once the doors closed. I signed up for unemployment and started looking for another job, the problem however was that on top of my school schedule being molded around my old work schedule there was this little thing called COVID-19 running rampant throughout the U.S. So, I went through most of my savings throughout last semester, didn't get single job opportunity, and was caught in a hard place; but the rock was slowly approaching. The next semester for me (the one I'm currently in) was me student teaching, a semester that the school states that you should really not have a job during this part of your schooling. Well, I didn't know where to turn, little to no money in my account, tired and hating myself for asking money from the government, my parents and my fiancée I felt like there was no way out but to quit. Then I heard about this program from one of my professors, a sort of work study program that is also open to students who will be student teaching. I couldn't quite believe what I was hearing, but I knew I had to try my hardest to get into that program.

Now I understand that this program won't 'fix' everything in my life, and I'm okay with that. Truly the most important thing that this program gave me was that little bit of breathing room and that little bit of relief of knowing that I'll be alright until the end of the school year.

Racial Equity in Music Education

Corresponding Author: Garcia, FiFi

Mentor: John Babcock

Major/Research Area: Music Education (MUS)

Additional Tags: Puksta Scholars

Oral Session 1 (9:30-10:30) Room 5

Eeny Meeny Miney Mo; Skip to My Lou; Camptown Races; These are songs that some can maybe recall or have sung or played before at some time. What would happen if you found out that these songs have a past rooted in racism? Music Education is a field that is adored by many. Many people remember experiencing their Music Education from grade school where they perhaps picked up a recorder, played a hand drum, or had a part in the school play. Music Education can be a joy to those who experience it but however, like any field of study can have its flaws. Music Education in the United States is centered around Western music theory and is how the curriculum is formed for preservice music educators. In Western music theory, there is not much diversity in the composers who we view as some of the greatest. Many folk songs being taught by educators have what we can call a questionable past in which the background of the song was used in the past to hurt and oppress people of a specific culture. Some people grew up on songs with a questionable past but may never be told the history of the music they learned. Sure, some of these songs were how many learn to count or how to keep a beat but is it worth it to keep passing down these songs that were meant to cause harm? There is an identified problem with teaching music with a questionable past as it continues to pass down racism in the classroom where students are expecting to feel welcomed and supported. What is being done to fix this problem? There are many lists of songs with a questionable past that are just a google away however, how do educators know what to look for if they haven't identified an issue with the music they are teaching? This information is not promised with a degree nor is it promised with the school handbook once you find your job. We should now focus on what we can do as a community to move towards racial equity in the curriculum for our students not only in Music Education but in all fields.

Abortion Access for the Transgender and Non-Binary Communities

Corresponding Author: Gibson, Ari

Major/Research Area: Management (MGMT)

Oral Session 1 (9:30-10:30) Room 5

The Impact of My Internship and How Earn and Learn Made it Possible!

Corresponding Author: Gustin, Christina

Mentor: Kathleen Senga

Major/Research Area: Chemistry (CHE)

Additional Tags: Earn and Learn

Oral Session 2 (10:45-11:45) Room 4

I am a Teaching Assistant for CHE 1801 General Chemistry Laboratory, sections L06/L07. My presentation is going to detail what my duties are, the impact it makes on the Department of Chemistry and Biochemistry and why it is important, how it is connected to my academic plan and future career goals, and how Earn and Learn made it all possible! I basically assist both the professors and the students in any way possible. In a regular semester, I would be the second point of contact for the students performing the experiments during the lab time. However, because of the new class design allowing for adherence to pandemic protocols, 2/3 of the class are remote at a time on Microsoft Teams and I have been primarily helping those students while the professors run the in-class experiments. I have been told by both professors that I TA for that my ability to be present for the online students while they take care of the in-class stuff has been a great help this semester, especially because both professors are new to MSU Denver. My reason for pursuing the internships initially had to do with needing the additional credits to graduate, however it has become so much more than that. Upon seeing what the pandemic has done to the education system, and with the stress it has put on me, I had the realization that instead of pursuing graduate school, I am instead pursue an alternative teaching licensure and teach secondary level science. So, this internship is giving me a good glimpse at what that will look like, especially through the connection I have with both professors. Without the Earn and Learn support, I would have had to take on another job just to financially be able to support myself, and my schedule does not have that room. In a nutshell, Earn and Learn has contributed to my success in a way that results in my ability to graduate this spring, and I am so thankful!

Health Interest Program

Corresponding Author: Guy, Danny

Major/Research Area: Nutrition Science (NUT)

Additional Tags: Earn and Learn

Oral Session 2 (10:45-11:45) Room 4

I am currently in the Health Interest Program internship which is operated through Denver Health and available to MSU, CU, and Regis University pre-health students. This organization helps connect undergraduate pre-health students with different medical career opportunities. They are a grassroots Denver health mentorship program that works to increase the success of underprivileged, underrepresented college students who are interested in the healthcare. The internship consist of multiple factors of which mentorship and counseling with a physician that aligns with each students preferences to help develop each of us over the course of a year. We

are expected to get a certain number of hours of clinical shadowing and mentor coaching throughout the year. We also go through two series of book club groups (1 each semester) and read it together in which we have different roles to fill to talk and discuss the book. We also take part in multitude of lectures and workshops given by experts in different health related fields helping bridge didactic learning with real life healthcare applications. Additionally, we take part in community service projects, leadership training, wellness activities, medical school and physician presentations and lastly a personal reflection journal we write and share with others. This has contributed greatly to my healthcare journey and opened me up to learn about every kind of healthcare route one can take. I am planning to apply to Osteopathic Medical school in the Spring 2022 and they have had multiple students and school administrators present about their school and the process of applying and getting accepted. Lastly, through all the science courses I have been through I have been able to learn inside the clinic and relate the biology information with real life scenarios.

MSU Denver Athletics

Corresponding Author: Harris, Emine

Mentor: Colleen Colles

Major/Research Area: Sport Management

Additional Tags: Earn and Learn

Oral Session 3 (2:30-3:30) Room 5

My internship is with MSU Denver athletics. I am learning how to run game day operations. My major is Sport Management and I am a senior, graduating in May 2021. MSU Denver is a member of NCAA Division II (www.NCAA.com) and competes in the Rocky Mountain Athletic Conference (www.rmacsports.org). Currently, MSU Denver sponsors 16 sports, providing over 200 student-athletes an opportunity to compete in one of the top programs in NCAA Division II while earning their degree. The mission statement is : MSU Denver athletics is committed to impacting the lives of student-athletes and developing future leaders by providing a championship caliber experience that emphasizes excellence in academics, in athletics and in the community.

MSU Denver athletics values education, excellence, integrity, accountability, respect, tradition and community. During my internship with MSU Denver Athletics I have been given different responsibilities during game days. I have learned the importance of communication working with different people in different sports. Game day operations is something that I want to do in the future and this opportunity was perfect for me. Besides game days I also work on Game notes and labeling pictures of the athletes. My schedule is very busy and there is always something I can do and I learn many new things. I am very satisfied with my internship and I am glad I can learn all these things that will help me find the right employment where I can embrace my skills and gain more knowledge in the near future.

A Novel Tool to Extracting WhatsApp Group Messages

Corresponding Author: Holsapple, Derek and Justin Strelka

Mentor: Mota Thyago and Steven Beaty

Major/Research Area: Computer Science (CS)

Session 3 (2:15-3:15) Poster 8

A social media platform known as WhatsApp provides users with end-to-end encryption for all messages sent and received. This privacy feature has attracted organized crime groups to use the platform to target their victims. Within the WhatsApp application, there are communication groups where individuals can gather and share content similar to a discussion forum. This work describes a novel tool that allows users to automatically join and monitor WhatsApp groups, organizing message contents by author and associated timestamp. These saved messages can then be used by law enforcement agencies to aid in their future investigations.

Colorado Is on Fire

Corresponding Author: Jenkins, Mason

Mentor: Todd Laugen

Major/Research Area: History (HIS)

Additional Tags: Earn and Learn

Oral Session 2 (10:45-11:45) Room 4

Colorado lost more forest to wildfires in 2020 than in the preceding 6 years put together and if you look at the historical wildfire record for Colorado, it is abundantly clear that 2020 is an outlier. This is both in terms of raw burned acreage, but more importantly in terms of the severity of the fires. In terms of technical analysis, at the time of writing (11/2020), there are no Burned Area Emergency Response (BAER) reports for the major 2020 wildfires this story will revolve around. Additionally, the causes of the Cameron Peak and East Troublesome fires are currently unknown as investigations continue; the Pine Gulch fire our last subject, was caused by lightning strike. We do know a lot about the fires as they currently burn though; and maps are a perfect way to contextualize the size of these blazes. Additionally, the Hayman burn scar provides us some perspective on fires of this type of severity and what we can look forward to as far as recovery.

Internship

Corresponding Author: Lewis, Christy

Major/Research Area: Human Services (HSP)

Oral Session 3 (2:30-3:30) Room 6

Harm Reduction Denver

Corresponding Author: Loomis, Julia

Mentor: Jason Lopez

Major/Research Area: Health Care Professional Services

Additional Tags: Earn and Learn

Session 2 (11:00-12:00) Poster 9

My presentation is based around my internship at Harm Reduction Denver, with what I learned and accomplished. Harm Reduction Action Center in Denver is a public health service organization that serves as Colorado's largest syringe access and exchange program. Harm reduction is a public health structure for those that are facing substance abuse and aims at reducing diseases (HIV and Hep C), spreading awareness about sexual health, and lowering the rates of mortality among drug users. As an intern, I had the opportunity to interact with the population that uses drugs and provide essential services to keep not only users safe, but also the community as a whole. The fixed site for syringe access for participants is open Monday to Friday from 9am - 12pm. In the afternoon, this time is dedicated to street outreach, community clean up, meetings, presentations, and administrative tasks. The objectives developed around the internship in the role as a community outreach and client services coordinator were to understand and participate in data collection, program analysis, community outreach, clean up, social media communications, fundraising sources, and policy research/legislative advocacy. A particular focus of my attention was centered towards client services, street outreach, and operation processes. Being supportive to administration staff, participating in center preparation, being hands on in health care navigation assistance, and more, all allowed me to gain knowledge in office protocols, community referrals, de-escalation techniques, and full Narcan training. This will be what my presentation overviews and summarizes from my experience as an intern.

Internship Overview: Youth Access Center (YAC)

Corresponding Author: Lyons, Kaileigh

Mentor: Katelen Fortunati

Major/Research Area: Social Work (SWK)

Additional Tags: Earn and Learn

Session 1 (9:45-10:45) Poster 7

My internship is at CASA of the 7th Judicial District and I am focusing my work in our Youth Access Center (YAC). The YAC provides social, educational, housing resources, food support, and more to youth in the Montrose, CO community. We serve youth ages 14 to 24. In my role as a social work intern I am building skills such as engagement, assessment, intervention, and evaluation as I work with youth in the YAC.

The impact of COVID-19 on the Homeless Population

Corresponding Author: McCloskey, Nicholas

Mentor: Angela Furney and Tara Hammar

Major/Research Area: Human Services (HSP)

Additional Tags: Earn and Learn, Community Based Project

Oral Session 3 (2:30-3:30) Room 6

The homeless population is, for the most part, ignored by the majority of people within society today. A total afterthought. At practically every major intersection in the city stands a human being, in tattered clothing, holding up a sign asking for the slightest bit of humanity from those who are a little more comfortable in life. Hardly anyone can spare it. The stigma around homeless people pre COVID-19 was already a problem. Dirty, criminals, addicts, failures, to name a few, are all labels that people associate with homelessness. But, when looking at how few resources are available to aid in helping this population, homeless people do not have much of a choice. How can you be expected to be clean without access to running water? How can you eat if you do not have money? Maintaining a job is extremely, extremely more challenging when you do not have some form of stability in your life. People with stable housing tend not to understand how difficult it is to get back to stability once you are homeless. The focus shifts from living to survival as desperation sets in, and no one can understand what that is like until they experience it. And then, throw a global pandemic on top of all the stigma already surrounding homelessness... well, now nobody will even go within six feet of someone who lives on the streets. I work with The Reciprocity Collective, and we have been actively assisted the homeless population throughout the pandemic. This is my first experience with work like this, and in my time with the organization, I have observed and learned so much. In this presentation, I hope to bring attention to a population that has been severely impacted by the impact, yet hardly anyone is noticing. I plan on going in depth into my observations while also providing research and facts to help raise awareness.

Hypnotherapy Internship and My Journey

Corresponding Author: McDonaugh, Dawn

Major/Research Area: Psychology (PSY)

Additional Tags: Earn and Learn

Session 2 (11:00-12:00) Poster 8

My name is Dawn McDonaugh. I am a senior at Metropolitan State University of Denver. My internship is with the Denver Hypnotherapy Center. The Denver Hypnotherapy center teaches hypnotherapy techniques to implement into patient care for mental health professionals. It was started 30 years ago as a school for the average person. It is estimated that about 50 % of people practicing hypnotherapy in Colorado was trained by this school. My work for this company is researching mental health topics and writing articles to explain them in a manner that is easy to understand by high school students. YouTube is where I find videos that help

explain mental health topics in an engaging and fun manner. I am fortunate to be able to work remotely from home. The hours are wonderful because I can do the work when I am awake, which is usually early morning and late evening. I focused my internship on research and writing to help me in areas that I am not strong in. The plan is pursuing my education to the master's level and these skills are important. Earn and learn has helped me accomplish my goals by providing financial support so I can focus my internship and not worry about having to about missing work. This internship experience is a great learning experience for me.

Transgender Youth in Colorado

Corresponding Author: McKeever, Krista

Mentor: Kat Martinez

Major/Research Area: Gender, Women, & Sexualities Studies (GWS)

Additional Tags: Earn and Learn

Oral Session 3 (2:30-3:30) Room 6

My internship is with a new nonprofit known as TYES, Transgender Youth Education and Support. While it is newly classified as a 501c3, TYES has been around for more than ten years. TYES works to support transgender youth and their families/caregivers who live in Colorado and at times, in the surrounding states. This support is seen with a yearly weekend camp, meetups throughout the year, twice-monthly support groups, a Facebook group, and setting up booths at relevant events. These support avenues have changed slightly with COVID but virtual support groups are still in effect. During my time with TYES, I have started multiple projects. One that I have headed is creating a new system for gathering new members' information. Additionally, I have created a survey to send out to current members to gather demographic information and see what TYES can do to help our community more, create a PDF to send to new members welcoming them to the group, and planning out a virtual meetup for TYES youth to gather online and play video games. This nonprofit meshes perfectly with my academic plan to support transgender youth, and my minor in Psychology also comes in handy. I have felt particularly drawn to issues surrounding gender and children which is reflected in my transcript with courses like: the psychology of gender, psychology of adolescence, gender politics of health, and sexualities and gender. I was a member of TYES before my internship and love being able to provide my time to an organization that is so close to me. Receiving the earn and learn scholarship has allowed me to focus my attention on school and not worry about supporting my family with another job that I don't have time for. I feel like I'm better able to focus and truly gain what one should from an internship without the concern of additional money coming in.

Generational Change

Corresponding Author: Miller, Ashley

Mentor: Kevin Zeiler

Major/Research Area: Human Services (HSP)

Additional Tags: Earn and Learn, Honors Program

Oral Session 1 (9:30-10:30) Room 6

I am working at a treatment facility that works with pregnant and parenting women who are recovering from addiction and escaping things like domestic violence. I work with women to build skills and their support system. I want to create generational change and this starts with getting mama's sober and present. Our women work with many systems, such as CPS, probation, and mental health services. I am an advocate for these women when they are alone and depleted. Treatment is a new beginning and it allows them to start a new journey. Supporting these women is my goal, and I can't wait to share my knowledge and experiences in my field.

Adams County Probation

Corresponding Author: Moore, Brooke

Mentor: Katelen Fortunati

Major/Research Area: Social Work (SWK)

Additional Tags: Earn and Learn

Oral Session 4 (3:30-4:30) Showcase Pre-recorded Talks (not live)

I have been interning at Adams County Probation located in Commerce City, CO. The Adams County probation office is a government agency that is part of the 17th Judicial District in Colorado. Colorado probation provides the court and the community with an alternative to prison for adults and juveniles who commit crimes. Currently I have a caseload about 25 clients who I supervise. I meet with my clients every 1-3 months, depending on their risk level to ensure that they have been compliant with their terms and conditions of their probation. If they have not been compliant with their terms and conditions, I take the necessary steps to either help them gain compliance, or send them back to court. Probation has helped with my academic plan and professional goals because it allowed me to experience a field of social work that I have not considered before. I assumed that I would end up working at a school, but my experience with probation has allowed me to widen my perspective and consider other options. The Earn and Learn program has assisted me several ways, but specifically it has helped me by supporting me financially throughout this semester. Not only from paychecks, but the Learn and Lunch Finance 101 class has also assisted me to better understand my finances and help me make better decisions.

Police Training: Is the Current Training for Police Officers Enough?

Corresponding Author: Naumann, Manna

Mentor: Angela Furney and Kimberly VanHoosier-Carey

Major/Research Area: Criminal Justice & Criminology (CJC)

Additional Tags: Puksta Scholars, Community Based Project

Oral Session 1 (9:30-10:30) Room 5

I wanted to learn more about the duties of a police officer and the training that they receive. I previously was aware that police training in America was minimal when compared to other countries. Police officers in America are trained for 21 weeks on average, the worldwide average is 2 years. I was also aware that police officers in America are not required to have any college education. I wanted to know if police training has actually been effective in teaching a police officer the duties of their job. Through my research I have found that police officers are often woefully underprepared for all the requirements that are expected of them. The amount of time a police officer spends in training cannot cover all of the duties that police officers handle. My project then became thinking about how I can help this situation. My first thought was making college a requirement for police officers. It has been proven that police officers with an Associate's Degree are less violent in confrontational situations than their counterparts without a degree. However, with limited time and resources, I knew it wasn't feasible to have a college degree become a requirement for police officers. Instead, I decided to come up with a comprehensive degree program for students who wish to become a police officer. A degree that is focused specifically on policing would be a step towards making college a requirement for police officers.

Social Emotional Learning

Corresponding Author: Nelson, Haley

Major/Research Area: Elementary Education (EDU)

Additional Tags: Earn and Learn

Session 4 (3:30-4:30) Poster 12

The focus of my project is on Social-Emotional Learning. Social-Emotional Learning is the process within which students comprehend emotions, make and complete goals, sense and display compassion for others, determine and uphold constructive connections with others, and make positive choices. Through Social-Emotional Learning, students also develop self-awareness and self-control that are imperative for school, work, and life as well as the relationships within those environments. I chose this theme because Social Emotional Learning plays an important role in developing relationships with students and creating a positive, safe, and nourishing classroom environment. Another reason I chose Social Emotional Learning as my project is that the classroom that I am in for student teaching participates in one Social Emotional Learning lesson every day and I am able to observe and collect data about how this is implemented in the classroom.

Challenges in Immigrant Communities and Ways to Help

Corresponding Author: Nunez Sifuentes, Karen and Duvia Ortega

Major/Research Area: Biochemistry (BCHM)

Additional Tags: Puksta Scholars, Community Based Project

Oral Session 1 (9:30-10:30) Room 5

It is estimated that there are 11 million undocumented in the United States. Despite the efforts and hard work to have a better life for their families, their immigration status and lack of resources prevents them from reaching their full potential. As Puksta Scholars, we worked on projects to advance underserved and underrepresented students into higher education. In addition, we connected with community leaders to address the lack of resources available to undocumented individuals such as access to education, professional development, jobs, health care, and financial assistance. Our goal is to continue to bring awareness to these issues and propose ways to support our communities.

Sustainability at the Co-op & 1st and Jovial Concepts

Corresponding Author: Philips, Heyward

Major/Research Area: Environmental Science (ENV)

Additional Tags: Earn and Learn

Oral Session 4 (3:30-4:30) Showcase Pre-recorded Talks (Not Live)

My internship began by working with Jovial Concepts. Jovial Concepts is a local non-profit organization that was created as a resource for community and stewardship. Jovial Concepts main goal is to raise awareness and create change for issues of social, economic, and environmental conflict. The organization collaborates with local community groups and organizations to promote effective and environmentally friendly practices. I started my internship with Jovial Concepts as part of the Sustainability team. In this role I worked to implement and create sustainable practices for the organizations food program, which is a food drive that occurs every week. Finding ways to implement compostable packaging and incorporate reusable items was an everyday challenge. As part of this team I was heavily involved with the Co-op at 1st, which is marketplace seeking to provide quality foods, products, and services aiming to help wellness within the community. The Co-op and Jovial Concepts share a building and aimed to join like-minded organizations in the Denver Area. As part of two collaborative organizations, I was able to help provide education, information, and sustainability awareness to local communities. As a member of the sustainability team, I was constantly working with the market and was a major role player in connecting environmentally friendly and sustainable business around Denver with the nonprofit and the market. I was able to reach out to a variety of sustainable vendors and get them paired with the organization and the market. Other portions of my internship included setting up an Earth Day event, Markets Grand Reopening Event, energy assistant programs, helping in the garden department with mini greenhouses, helping people get set up with the garden program, supporting the food

drive, etc. There are several ways in which working with these two organizations has furthered my coursework. I have just begun working with the garden program to help create a packet of education on sustainable gardening and water use. My major is water management and hydraulic sciences, so I can not wait to see what is in store for the spring and warmer months ahead! Being able to work on the sustainability team has allowed me to work with other departments as well. One of my fellow interns is a recent graduate from MSU as an environmental engineer. Being able to collaborate with her on these projects was fun and educational for both of us! As part of the arch of environmental science, I have been able to learn more about implementation of sustainable practices and pairing this with community outreach and education. Need to mention grants and funding during presentation, development of the food drive, amount of people the organization serves, what sustainable vendors I was able to work with and food groups.

Interning with Covered Colorado

Corresponding Author: Pinder, Yvonne

Faculty Mentor: Randy Smith, Amanda Campbell and Angela Furney

Major/Research Area: Psychology (PSY)

Additional Tags: Earn and Learn

Oral Session 3 (2:30-3:30) Room 6

My internship is with Covered Colorado- a local non-profit working to empower survivors of human trafficking to self-sufficiency. We work with the adult population of trafficking victims over the age of 18 and currently serve only women but are looking to make those accommodations in the future. Survivors go through a three-step program: Engage, Empower and Thrive. Each step is catered to providing every person with needs that will give them agency and stabilization. Covered works to meet survivors where they are at and fulfill their needs of creating a community, receiving counseling, transitional to permanent housing, food, advocacy and case management. I'm currently a case management intern, working with clients one-on-one to help them accomplish their needs and goals. This is everything from working with legal advocacies, to coordinating transportation and budgeting. Case management allows me to access and utilize community resources that best fits the client's needs. This role has been invaluable in working to create objective case notes to document each transaction. Through my internship, I'm allowed to work with clients as they progress and heal from their traumas.

Shinkansen Bullet Train

Corresponding Author: Prieto, Lizbeth

Mentor: David Bechtold

Major/Research Area: Management (MGMT)

Oral Session 2 (10:45-11:45) Room 4

Biomimicry is an imitation of nature's designs that can inspire us to create something new. It is about being observational of our natural surroundings and the creations that nature has to offer. For example, imagine that you are in Japan traveling on the high-speed railways of the Shinkansen Bullet train during 1989. This train is referred to as the Bullet train for a reason; it was built to be one of the most rapid trains in the world.

The Bullet train carries millions of passengers every year and reaches speeds of two hundred miles per hour. The only problem with such speeds is that air pressure would build up when traveling through tunnels which caused a loud yet disturbing noise when exiting the tunnel. The loud noise was a dreadful problem that had to be resolved. So, an engineer was tasked to find the solution.

"Eiji Nakatsu, an engineer with JR West and a birdwatcher, used his knowledge of the splash less water entry of kingfishers to decrease the sound generated by the trains" (AskNature). Nakatsu became inspired by the Kingfisher since its capable of moving from low resistance air to high resistance water. A Kingfisher is a small bird that are like hummingbirds. They can eat about ten fish in a day. It is known to have a long and narrow pointed beak which is the reasoning behind its splash less water entry.

His creativity allowed him to make a major impact on the Shinkansen Bullet Train. The use of biomimicry in this situation changed the world of rail travel. Nakatsu used biomimicry when he modeled the front of the train based on the Kingfisher's beak.

The biomimicry technique ended up fixing the disturbing noise problem, increased operational efficiency as well as reduce energy use. The Bullet Train underwent an innovative journey that had not been possible without the use of biomimicry.

Colorado Disability Partnership

Corresponding Author: Sauderland, Brianna

Mentor: Randy Smith

Major/Research Area: Psychology (PSY)

Additional Tags: Earn and Learn

Oral Session 3 (2:30 -3:30) Room 6

Colorado Disability Partnership (CDP) is the political home for people who are passionate about disability rights. As the first 501(c)(4) dedicated to this issue in Colorado, CDP is a new organization that will help the Colorado Disability Community to build political power by having the ability to lobby on issues, endorse and support candidates directly, and hold Democrats and Republicans alike accountable. Colorado's disability community depends on policy passed at the local, state and national levels to protect rights and fund vital services. Building more political

power will help ensure that those leaders listen to us when they make decisions about policy that affects our lives.

As an intern for the Colorado Disability Partnership, funded by the Hart Center for Public Service, my role is to help build the framework for this new organization as a project coordinator and manager. Building the framework of a new organization includes helping to establish new technologies (like a cloud-based file management system), create marketing materials (like logo, letterhead, and zoom backgrounds), and keep the board members on task as I help them achieve the vision of success for CDP that they have described to me. I work side-by-side with board members to create the beginnings of what will be a new organization that has the opportunity to change the landscape of disability policy in Colorado and beyond. This internship has been enlightening, fulfilling, and a skill-building experience that I can take with me in my future career as I serve the community with my psychology degree from MSU Denver.

Pre-med student internship at Panorama Orthopedic Center

Corresponding Author: Simmons, Will

Mentor: Clare Hays

Major/Research Area: Biology (BIO)

Additional Tags: Earn and Learn

Oral Session 2 (10:45-11:45) Room 5

Over the last four months I have interned at Panorama Spine and Orthopedic center. During this internship my mission was to learn as much about the physical therapy field, see how doctors are incorporated within the field and how a patient gets taken care of on a day-to-day basis. I was particularly intrigued in the process from surgery to rehabilitation. This internship is meant to give me hands-on knowledge and experience as I look to add more skills onto my resume before applying to med-school.

The Development of Consent Curriculum in Denver Public Schools

Corresponding Author: Stone, Kelly

Mentor: Kristen Lyons

Major/Research Area: Psychology (PSY)

Additional Tags: Puksta Scholars, Community-Based Project

Oral Session 2 (10:45-11:45) Room 5

Public school consent education is not required and is rarely taught within the realm of sexual or physical health classes. This could be related to the high reporting of sex crimes that occur at or just after adolescence and the hyper sexualization of women in society. Increasing the knowledge base of the middle school aged students would assist in teaching respectful and prosocial behaviors that surround sexual activities common in high school or in the early twenties.

The intention of my project is to enhance the curriculum taught surrounding consent that would lead to a larger number of school-aged students fully understanding the concepts outlined in my lesson plan. In order to reach this goal, I will be making relationships with local organizations, such as Project Pave to assist me on how to reach my intended audience and to train their volunteers on how to teach my content to various students.

Teacher and Student Wellness

Corresponding Author: Summers, Rachel

Major/Research Area: Elementary Education (EDU)

Additional Tags: Earn and Learn

Poster Session 3 (2:15-3:15) Poster 7

This school year I have been blessed with an internship at Gust Elementary via Denver Public Schools. Denver Public Schools has a mission to create an environment where rigorous and culturally-responsive learning can take place. Being a part of Denver Public Schools has truly accelerated my growth as a teacher and pushed me to be a rigorous, kind, and responsive educator. During my time at my internship I have developed close bonds with my students, differentiated and implemented various lesson plans, taught in a whole, small group, and to individuals, became very familiar with curriculum, and I have had the opportunity to teach virtually and in-person. During my internship I have reflected on my education and the type of teacher I want to be. I was taught through my coursework how vital social emotional learning is for students. Therefore, I have become a teacher who focuses on autonomy and social emotional learning in the classroom. Each day I provide an environment where students can feel safe and valued. We practice taking breathers, sharing our emotions, doing yoga and dancing, and many other activities to promote social emotional learning. The Earn & Learn program has truly helped me to be able to focus more on not only my student's wellness, but mine as well. Since student teachers are unpaid I spent my first semester student teaching and working to support myself. I was under an immense amount of stress and I had no time to focus on my well-being. Due to the generosity of the Earn & Learn program a lot of the financial stress I was facing has melted away, and I have had more time to take care of myself and focus more of my energy on to my students. I can confidently say that this program has changed my life and impacted me deeply, not only financially but also mentally and emotionally.

Denver County Child Welfare

Corresponding Author: Teasdale, Kimberly

Major/Research Area: Social Work (SWK)

Additional Tags: Earn and Learn

Poster Session 1 (9:45-10:45) Poster 8

My poster presentation will include the mission and vision statement of the division of child welfare at Denver County. It will also include an overview of the work I have been doing on the intake team and describe the role of an intake caseworker. I will be including a brief list of things I have learned over the last two semesters in my role as an intern. I will be connecting what I have learned in the social work program to my role as an intern and will include a list of theories we use in the child welfare field. Lastly, I will include a write-up of how impactful the earn and learn program has been for me, and I will discuss how the program allowed me to focus more on my internship and schooling.

The Ethnic Cleansing of Amhara People in Ethiopia

Corresponding Author: Twodros, Betelhem

Mentor: Devon Beezley

Major/Research Area: Computer Science (CS)

Additional Tags: Puksta Scholars

Oral Session 1 (9:30-10:30) Room 5

Amhara people are residents of the Ethiopian central highlands. They are one of the major ethnolinguistic groups in the country. The language of the Amhara is known as Amharic which belongs to the Semitic language family. The Amhara inhabit in all parts of the present-day Ethiopia, and have long and remarkable history in the Ethiopian State formation. In 1991, the Ethiopian government formed "Ethnic based Negative Federalism" which make the Amhara people stateless in Ethiopia. Since then, more than two million Amhara were eliminated from Ethiopia. Some left the country; many of them killed by organised and state funded ethnic cleansing. Following the coming to power of Dr. Abiy Ahmed Ali in 2018, there was hope in the country that human rights will be respected. However, systematic Ethnic cleansing continued in a more harsh and heart breaking manner. Since 2018, more than 10,000 innocent Amhara got slaughtered all over the country. In this month only, more than 2000 Amhara massacred; among whom many of them were consumed by cannibalism Gumuz tribes. Others got burned like trash and excavators used to evacuate the dead body. Therefore, all the human race should struggle to stop Amhara genocide in the 21st century before the country goes to endless Civil War.

Hence, the U.S., E.U., and other providers of weapons to Ethiopia should cut off weapons sales. The U.N., African Union, and the U.S. should offer to broker a ceasefire between the parties in Ethiopia and bring them to the negotiation table to end this incipient civil war. The genocidal intent and atrocities committed by the Oromo Liberation Army (OLA), Tigrian Libration Front

(TPLF) and Gumuz Militia Groups should be condemned and the perpetrators of the massacres of Amharas should be brought to justice. The Ethiopian Constitution should be amended to remove the right of secession of ethnic regions, to prohibit regional militias, and to strengthen the federal government. Ethiopian diasporas in the U.S. and Europe should stop sending money to support *the ethnic war*.

Harm Reduction and Internship Promotion

Corresponding Author: Thayer, Charissa

Mentor: Randyl Smith, Amanda Campbell and Angela Furney

Major/Research Area: Psychology (PSY)

Additional Tags: Earn and Learn

Oral Session 2 (10:45-11:45) Room 6

Internships can make or break a developing a career. Many employers are looking for people with experience and many students need real life experience to guide their career path. To get this experience, I (Charissa Thayer) am participating in an internship with The Harm Reduction Action Center in Denver, Colorado. At this location, I have learned more than just applicable skills in the psychological sciences but have also learned about the community of Denver and more about the population that the Harm Reduction Action Center serves. Harm reduction comes from the basis of keeping people as safe as possible while they may engage in dangerous activities. By reducing the harm of these behaviors, death, disease, and other harms can be prevented.

At the Harm Reduction Action Center, I participate in daily upkeep, I engage with participants and connect them with resources, I help with outreach in the Denver community and provide those services there, and I work on special projects to benefit the program and its participants. While engaging in these work-tasks I also learn valuable career skills such as interpersonal communication, public health knowledge, conflict management, some counseling related practice, community relations, multiculturalism, and more. Through daily activities, outreach programs, working close with staff members, and researching harm reduction, I have built required and desired skills for a future career. I have also learned a lot about harm reduction practices which will follow me in my future endeavors. Overall, having an internship can provide one with skills, competence, experience, networking connections, career specific knowledge, and confidence in the ability to integrate one's academic experience with a professional one.

SMART, STRONG, AND BOLD GIRLS

Corresponding Author: Torres, Zaira

Major/Research Area: Social Work (SWK)

Additional Tags: Earn and Learn

Poster Session 1 (9:45-10:45) Poster 9

For my senior experience I am completing my internship at Girls Inc of Metro Denver located at 1499 Julian St, Denver, CO 80204 (West Colfax). Girls Inc. of Metro Denver (GIMD) mission statement is to "Inspire all girls to be strong, smart and bold" with the vision to empower girls and create an equitable society. GIMD was founded in 1983 after a group of residents became concerned with the high rates of teen pregnancy, academic failure, and the girls falling victim to juvenile delinquency (GIMD, 2021). Through programs that use research-based curriculum that are designed to equip girls with life long skills that will allow them to navigate gender, economic and social barriers. The services offered are programs which are age appropriate to serve girls from elementary to college level.

This Spring 2021 I am working with the Elementary programs. I am currently helping with classes such as "Heart Art", "Body basics" and with the tutoring program. My role as an intern is to help with tech support since classes are through Zoom. Also, I monitor the chat and make sure girls are validated when they share and participate in class. I also take attendance and make sure I put in on the attendance document to track the number of participants in classes. I also help create powerpoints for classes and come up with activities for girls. I also demonstrate behavior such as turning on my camera and participating in the chat as well as unmuting to share when appropriate. I also take kit packages to girls who can't pick them up from the GIMD center to their homes. In addition to working with elementary girls I am also working with girls at East High school and teaching them about social justice.

The Earn and Learn Program has helped me work less hours at my regular job and I have been able to focus on my academics. Getting paid to do work at my internship has been such a great opportunity because I am able to spend more time on my academic goals. Being able to get paid for work that connects to my learning is such an amazing opportunity and I am very thankful. Now I have more time to focus on my homework and time to do more projects at GIMD. Being paid has helped me in better mental health and not stress as much.

Playing for Change!

Corresponding Author: Vidal Castro, Samantha

Major/Research Area: Integrative Health Care (IHC)

Additional Tags: Puksta Scholars, Community-Based Project

Oral Session 2 (10:45-11:45) Room 5

Physical inactivity is a public health issue being the fourth leading cause of mortality worldwide. Promoting physical activity (PA) in children and adolescents develops a lifelong engagement. Physical activity is a health enhancing behavior that reduces the risk of several chronic diseases. Current and future health benefits can be obtained through engaging in physically active lifestyles such as; building strong bones, healthy joints, a strong heart, a good mental health

and prevents today's major public health concern – obesity. Despite these health benefits, many young people are not engaging in recommended levels of PA. Less than 24% of children 6 to 17 years of age participate in 60 minutes of physical activity every day. In young people, domains of PA include sports such as extracurricular and club sports, active commuting, and physical education (PE). The goal for this project, is to promote physical activity in the community that faces several barriers. Partnering with Soccer Without Borders (SWB) gives access to volunteer and directly benefit the community. SWB is designed to address the complex barriers minorities face, reaching and retaining youth that don't have sufficient resources. Financial instability is one of the biggest issues in allowing youth to participate in extracurricular activities. SWB is a non profit organization that focuses to use the potential of soccer to inspire youth to achieve growth, embrace, and develop personal success. Physical activity (PA) promotion among youth is a public health priority, and there is a need for its community engagement to help support such initiatives.

Proposal to Increase African American Student Retention

Corresponding Author: Walker, Emanuel

Major/Research Area: Computer Information Systems (CIS)

Additional Tags: Puksta Scholars

Oral Session 1 (9:30-10:30) Room 5

African American student enrollment and retention continue to decrease at MSU Denver. I propose a one-year comprehensive program that includes experiential learning, digital badging, and mentorship to increase retention and completion rates amongst African American students.

Visual Arts Education during COVID-19

Corresponding Author: White, Adrienne

Mentor: Michaele Reddy

Major/Research Area: Art Education

Additional Tags: Earn and Learn

Oral Session 3 (2:30-3:30) Room 5

In this Spring 2021 semester, I am completing my semester of student teaching for my Art Education degree, as well as for attaining my K-12 Art Teacher licensure. I am placed at Drake Middle School, where I have provided remote, hybrid, and in-person visual arts instruction for upwards of 150 students. Student teaching can be difficult in the best of times, as it is an unpaid full-time job demanding of one's full focus for the semester. During the COVID-19 pandemic, student teaching has become even further complicated, as education is more unpredictable and demanding than ever. During this time, there is little opportunity for financial flexibility for anyone. The Earn & Learn program afforded me the financial stability I

have needed to remain on track and graduate in May. Perhaps most importantly, this stability has also allowed me to meet the complex needs of my student in this unique moment in history. Children are now faced with gaining their education during a collective, international trauma, all while striving to meet their foundational developmental milestones. In my work this semester, I have strived to provide trauma-informed, equitable education to all my students, through the unique benefits of visual arts education. Art education provides the transferable skills of hands-on problem-solving, as well as critical thinking regarding visual culture. The future demands skills which prepare students for an increasingly digital, visual age. Through this program, I have been empowered to participate in their preparation for their days ahead.

Foster Source-Serving Foster Parents Throughout Colorado

Corresponding Author: Williams, Samatha

Mentor: Olivia Hunte

Major/Research Area: Social Work (SWK)

Additional Tags: Earn and Learn, Honors Program, Service Learning

Oral Session 4 (3:30-4:30) Showcase Pre-recorded Talks (Not Live)

The following presentation is intended to highlight Foster Source as a non-profit organization. Foster Source provides a number of services for foster parents throughout the state of Colorado. These services include educational trainings, relief services, therapeutic services, free meals, and more. My time at this agency has been spent with a focus on development and therapeutic services. Through this, there has been a number of academic opportunities such as non-profit management, funding, grant writing, and more. This presentation will highlight the impact of therapeutic services that have been provided to our clients including talk regarding our partnership with Sondermind (virtual therapy platform), and equine therapy. My hope is to highlight the impact these therapeutic services have had on Foster Parents throughout Colorado.

My Experience with Art from Ashes

Corresponding Author: Zamora, Angela

Mentor: Jovan Hernandez

Major/Research Area: Psychology (PSY)

Additional Tags: Earn and Learn

Oral Session 3 (2:30-3:30) Room 5

The presentation will encompass several topics such as the mission of Art from Ashes and the activities they offer to the community. I will also speak to my role within the organization including tasks and responsibilities, and my supervision and learning outcomes. The challenges I dealt with and resources to successfully overcome these obstacles will be discussed. Closing comments include the impact this internship had on my self-awareness and future plans.

Select Physical Therapy

Corresponding Author: Zenteno, Irma

Mentor: Benjamin Thompson

Major/Research Area: Exercise Science (EXS)

Additional Tags: Earn and Learn

Oral Session 2 (10:45-11:45) Room 5

I currently intern at Select Physical Therapy. As the name implies it is a physical therapy office that helps patients return to functionality after an injury or chronic condition. I am an Exercise Science major w/a minor in pre-health and nutrition. Upon securing the internship I created a "learning contract" to help highlight the educational experiences I was looking to achieve with my university supervisor as well as my intern supervisor. These learning objectives are specific to physical therapy and patient care. My degree is actually a great degree into physical therapy grad school program. Most of my undergraduate has helped me prepare for a setting like physical therapy. Going from the classroom setting to real life was not an easy transition for me. I thrive in an academic environment, however I sometimes have a hard time applying what I have learned to the real world. This internship has provided me with the opportunity to really test and improve this skill. It has also most certainly helped me communicate and initiate educational experiences that I otherwise would have missed out. Although, I am not sure a PT program is in my future I know I will be somewhere in the healthcare field. This internship has really helped me see and learn a lot about patient interaction. In addition, to patient interaction I have been able to shadow multiple physical therapist and observe many recovery modalities used. This internship has sparked my interest in physical therapy and has helped my professional development.